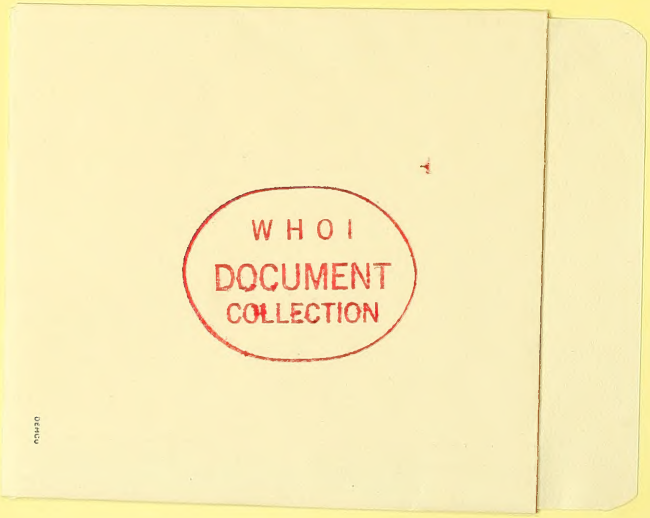
Beach Changes at Atlantic City, New Jersey (1962-73)

by
Dennis P. McCann

MISCELLANEOUS REPORT NO. 81-3

MARCH 1981

U.S. ARMY, CORPS OF ENGINEERS
COASTAL ENGINEERING
RESEARCH CENTER
Kingman Building
Fort Belvoir, Va. 22060



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REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: MR 81-3
2. GOVT ACCESSION NO.:
3. RECIPIENT'S CATALOG NUMBER:

4. TITLE *(and Subtitle)*: BEACH CHANGES AT ATLANTIC CITY, NEW JERSEY (1962-73)

5. TYPE OF REPORT & PERIOD COVERED: Miscellaneous Report

6. PERFORMING ORG. REPORT NUMBER:

7. AUTHOR(s): Dennis P. McCann

8. CONTRACT OR GRANT NUMBER(s):

9. PERFORMING ORGANIZATION NAME AND ADDRESS:
Department of the Army
Coastal Engineering Research Center (CERRE-CS)
Kingman Building, Fort Belvoir, Virginia 22060

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: D31194

11. CONTROLLING OFFICE NAME AND ADDRESS:
Department of the Army
Coastal Engineering Research Center
Kingman Building, Fort Belvoir, Virginia 22060

12. REPORT DATE: March 1981

13. NUMBER OF PAGES: 142 139

14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*:

15. SECURITY CLASS. *(of this report)*: UNCLASSIFIED

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release, distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Atlantic City	Beach profiles
Beach erosion	Beaches
Beach Erosion Program	Shoreline changes
Beach nourishment	Shore structures

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Repetitive surveys of the above MSL beach were made along seven profile lines at Atlantic City, on the northeast end of Absecon Island, New Jersey, from 1962 to 1973. Major beach-fill projects were accomplished in 1963 and 1970 which introduced approximately 428,000 and 635,000 cubic meters of fill material, respectively, to the northernmost half of the study area; movements of this material are discussed. Seventeen storms were reasonably well

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documented during the study and their effects are reported. Measured storm changes were highly variable. For a given storm, adjacent profiles often indicated opposite changes, with one accreting and one eroding. This is attributed to structural effects, as well as wave refraction effects near Absecon Inlet. Storm changes of the MSL shoreline position were often opposite in sign from beach volume changes. Frequently, the shoreline change indicated accretion, while the beach volume actually suffered a net loss. The largest beach changes measured resulted from the storm of 23 September 1964, which eroded an average of about 23 cubic meters per meter of beach face above MSL, and the storms of 16 September 1967 and 25 February 1968, which caused an average shoreline recession of 5.9 meters. Beach changes were found to be seasonal, with the greatest volume of sand above MSL from May to October. The data collected provide no information on the profile changes occurring below MSL.

PREFACE

This report is published to provide coastal engineers with a description of beach changes at Atlantic City, New Jersey. The 11-year study was designed to measure beach responses to storm events as well as seasonal variations, and was begun shortly after, and as a consequence of the devastating storm of 5 to 9 March 1962. The work was carried out under the coastal processes program of the U.S. Army Coastal Engineering Research Center (CERC).

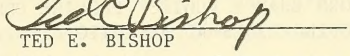
The report was prepared by Dennis P. McCann with the assistance of A.E. DeWall, under the general supervision of C. Mason, former Chief of the Coastal Processes Branch, Research Division.

The U.S. Army Engineer District, Philadelphia, performed all survey work except for a period in 1963-64 when data collection was contracted to Mauzy, Morrow & Associates of Lakewood, New Jersey. All data analyses and interpretations were made at CERC with assistance by M. Fleming, T. Lawler, D. French, A.E. DeWall, and W.A. Birkemeier.

Special thanks are extended to the visual observers from the City Engineer's Office of Atlantic City: J. Dolan, R. Badger, C. Turner, and C. McDonnell. Thanks are also extended to C.H. Everts, C. Galvin, K. Jacobs, M.T. Czerniak, and A.E. DeWall for their substantial contributions to this report from previous work on this subject. The author acknowledges the helpful review comments from A.E. DeWall, W.A. Birkemeier, C. Galvin, R.M. Sorensen, and R.J. Hallermeier.

Comments on this publication are invited.

Approved for publication in accordance with Public Law 166, 79th Congress, approved 31 July 1945, as supplemented by Public Law 172, 88th Congress, approved 7 November 1963.



TED E. BISHOP
Colonel, Corps of Engineers
Commander and Director

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CONVERSION FACTORS, U.S. CUSTOMARY TO METRIC (SI) UNITS OF MEASUREMENT

U.S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	by	To obtain
inches	25.4	millimeters
	2.54	centimeters
square inches	6.452	square centimeters
cubic inches	16.39	cubic centimeters
feet	30.48	centimeters
	0.3048	meters
square feet	0.0929	square meters
cubic feet	0.0283	cubic meters
yards	0.9144	meters
square yards	0.836	square meters
cubic yards	0.7646	cubic meters
miles	1.6093	kilometers
square miles	259.0	hectares
knots	1.852	kilometers per hour
acres	0.4047	hectares
foot-pounds	1.3558	newton meters
millibars	1.0197×10^{-3}	kilograms per square centimeter
ounces	28.35	grams
pounds	453.6	grams
	0.4536	kilograms
ton, long	1.0160	metric tons
ton, short	0.9072	metric tons
degrees (angel)	0.01745	radians
Fahrenheit degrees	5/9	Celsius degrees or Kelvins

To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use formula: $C = (5/9)(F - 32)$.

To obtain Kelvin (K) readings, use formula: $K = (5/9)(F - 32) + 273.15$.

BEACH CHANGES AT ATLANTIC CITY, NEW JERSEY (1962-73)

by
Dennis P. McCann

I. INTRODUCTION

Beach changes observed during repetitive surveys at Atlantic City, New Jersey, conducted by or for the Corps of Engineers in a 11-year study of seven profile lines from October 1962 to May 1973, are analyzed as part of the U.S. Army Coastal Engineering Research Center (CERC) Beach Evaluation Program (BEP) (formerly known as the Pilot Program for Improving Coastal Storm Warnings or Storm Warning Program). The BEP's objective is to measure beach and dune changes due to erosion and accretion at selected localities and relate these changes to the coastal processes producing them. The BEP was a direct outcome of investigations into the effects of the Great East Coast Storm of 1962 (see U.S. Congress, 1962).

Although this report meets the objective of the BEP, the program encountered many difficulties, including relatively few documented storms in the study area from 1962 to 1973 (the duration of the study), the difficulty in obtaining surveys immediately before and after the storms which did occur, and the difficulty and expense of obtaining continuous wave data. However, numerous data were collected of related wave, tide, and beach conditions, thus providing a substantial base for a long-term study of beach response having useful engineering applications.

This report presents both quantitative and qualitative analyses of beach profile changes and supporting data obtained at Atlantic City, and describes the survey procedures used and accuracy obtained. The three categories of beach profile changes analyzed are: (a) short-term changes, including storm-induced changes and other changes between surveys; (b) long-term changes, including seasonal and yearly changes; and (c) artificial effects, which include the effects of manmade structures such as groins and jetties as well as beach fill placed during the study period. The mean sea level (MSL) shoreline position and the volumes of sand stored on the beach above the MSL datum are the two principal variables analyzed. Observed wave conditions and climatic conditions are used to explain apparent trends in beach changes.

II. STUDY AREA

1. Location.

Atlantic City is located on Absecon Island, a barrier island off the Atlantic coast of southern New Jersey, 161 kilometers south of New York City (Fig. 1). The island is bounded on the south by Great Egg Harbor Inlet, and on the north by Absecon Inlet, and has a straight coastline oriented 64° east of north. Lakes Bay is the main body of water separating the island from the mainland.

Absecon Island is situated in an open section of coastline, partially sheltered by Long Island and Cape Cod from waves out of the north and northeast and by the Outer Banks of North Carolina from waves out of the south-southeast (Fig. 1). Bathymetry off the coast of Absecon Island is shown in

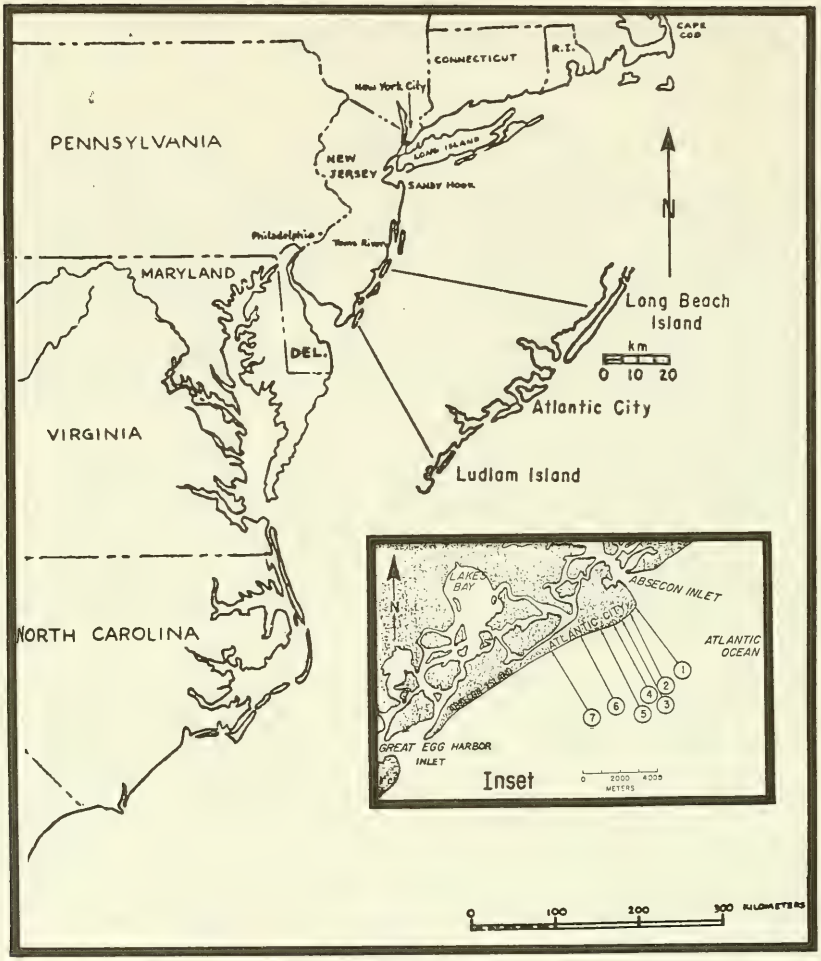

Figure 1. Study area showing profile line locations.

Figure 2. Most of the depth contours tend to be roughly shore-parallel, with linear shoals that trend toward the east off the central part of the island. The distance from the edge of the Continental Shelf, located at a depth of about 128 meters (420 feet), to the center of the island is approximately 125 kilometers.

2. Civil Works History.

Absecon Inlet is of great economic importance to Atlantic City as a result of its extensive use by recreational and commercial fishing fleets. During the early 1960's the inlet handled approximately 91,000 metric tons of waterborne commerce annually; however, this has recently tapered off to average

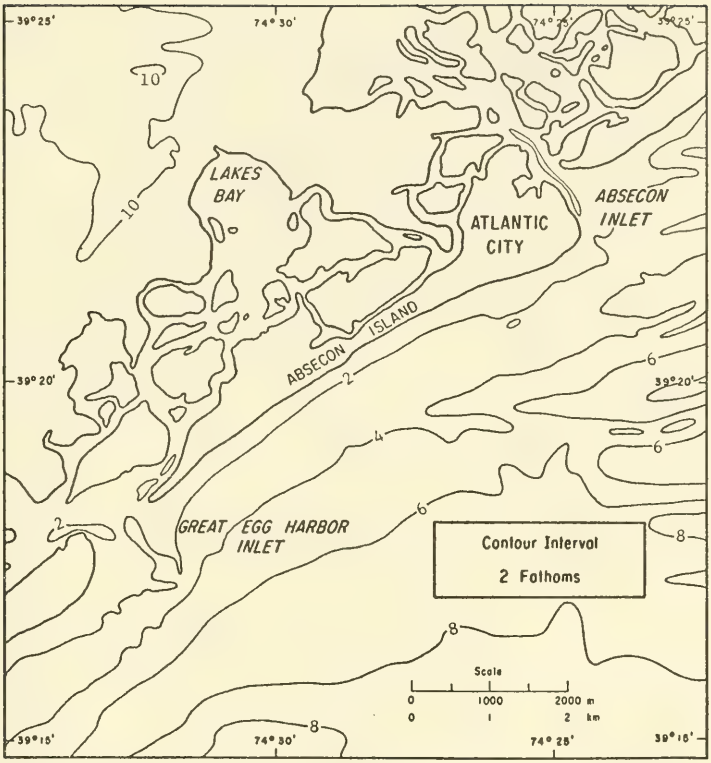

Figure 2. Bathymetry off Absecon Island.

less than 46,000 metric tons. Absecon Inlet has been maintained by the Federal Government since 1910.

Groin construction along the ocean frontage of Atlantic City, funded jointly by the City and State, began in 1928; 12 groins and 1 jetty were built between Absecon Inlet and Illinois Avenue. Eight of these groins and the jetty are still in existence, as shown in Figure 3 and in Table 1 which lists the coastal structures at Atlantic City. Other major structures (see Table 1 and Fig. 3) include the Boardwalk, which extends along the entire length of the ocean and inlet frontage, and five piers. Some of these structures are shown in Figure 4.

The only beach-fill project before 1962 consisted of about 816,000 cubic meters of material placed along the ocean frontage in 1948. However, an offshore sand-dumping test was conducted from 1935 to 1943 in which 2.7 million cubic meters was dumped into 5 to 6 meters of water southwest of Steel Pier which resulted in no measurable benefit to the shoreline (Yasso and Hartman, 1975). Approximately 428,000 cubic meters of sand was placed between Oriental and Virginia Avenues between February and May 1963. During the summer of 1970, approximately 635,000 cubic meters of fill was dumped along the beaches

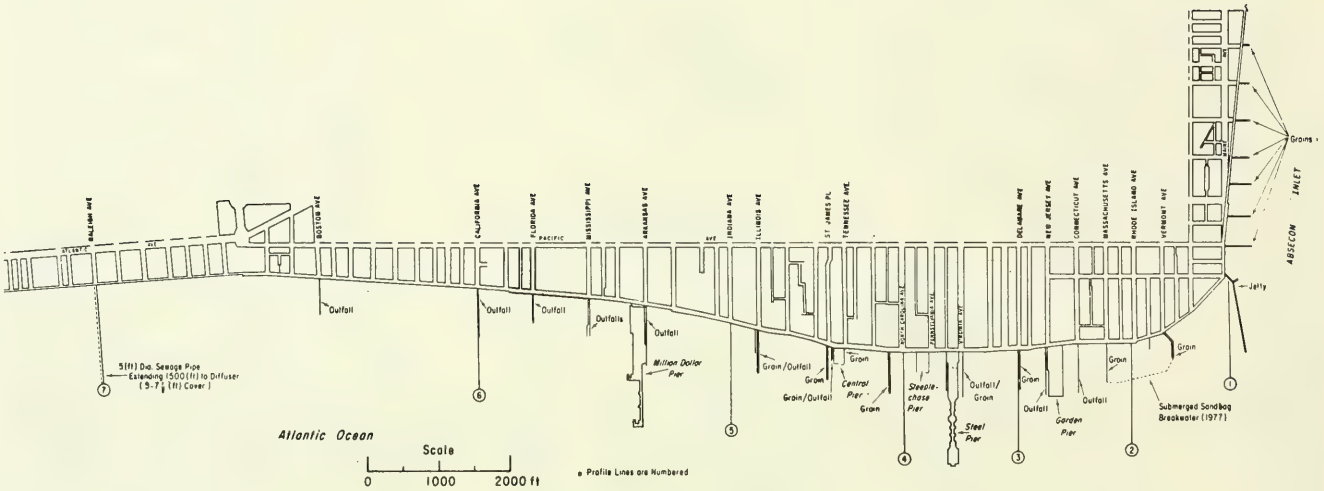

Figure 3. Structures along Absecon Inlet and Atlantic City ocean front.

Table 1. Structures along Absecon Inlet and the coast off Atlantic City[1].

Location	Construction type	Top elevation (MLW)		Top width	Length	Year built	Condition 1972
		inner (m)	outer (m)	(m)	(m)		
N. side of Absecon Inlet	Stone jetty	2.44	2.44	4.57	1,137.00	1952-66	Good
Between Caspian and Melrose Aves.	Timber bulkhead	----	----	0.76	588.00	1935	Good
Adriatic Ave.	Timber and stone groin	2.44	2.13	4.27	86.56	1932-58	Good
Drexel Ave.	Timber and stone groin	2.44	2.13	4.27	50.29	1930-46	Fair
Melrose Ave.	Timber and stone groin	2.44	2.13	4.27	81.38	1954	Good
Melrose Ave. to 91 m south	Stone revetment	----	----	----	----	----	----
Madison Ave.	Timber and stone groin	2.74	2.13	4.27	68.58	1954	Good
Between Madison and Euclid Aves.	Timber bulkhead groin	----	----	0.61	457.20	1935-61	Good
Grammercy Ave.	Timber and stone groin	2.74	2.13	4.27	79.25	1954	Good
Between Grammercy and Atlantic Aves.	Stone groin	3.05	2.13	4.27	102.41	1946-56	Good
Between Atlantic and Euclid Aves.	Stone groin	2.74	2.13	4.27	94.49	1946-58	Good
Pacific Ave.	Stone groin	2.44	2.13	4.27	102.41	1946-58	Good
Oriental Ave. (36.6 m N. of profile 1)	Stone jetty	3.35	2.13	4.27	358.75	1946-61	Good
Vermont Ave.	Stone groin	3.05	0.30	4.27	121.92	1930-61	Good
Massachusetts Ave.	Stone groin	3.05	2.13	4.57	167.64	1948	Good
Between Vermont and Massachusetts Aves.	Sandbag breakwater	Top is approx. 1.2 m below MLW					
Between Connecticut and Massachusetts Aves.	Timber bulkhead	----	----	----	----	1932	Poor
Connecticut Ave.	0.5-m outfall	----	----	----	----	----	----
Under N. edge of Garden Pier	Timber and stone groin	----	----	----	----	----	Poor
New Jersey Ave.	Garden Pier (0.76-m outfall)	----	----	----	----	----	----
Delaware Ave. (4.6 m N. of profile 3)	Timber groin	2.44	2.13	1.22	182.88	1950	Fair
Virginia Ave.	Timber and stone groin (0.76-m outfall)	2.44	2.13	1.22	167.64	1950	Good
Between Presbyterian and Virginia Aves.	Steel Pier (old timber groin beneath)	----	----	----	----	----	----
Between North Carolina and Pennsylvania Aves.	Steeplechase Pier (0.91-m outfall to S.)	----	----	----	----	----	----
Between North and South Carolina Aves.	Timber groin (60 m S. of profile 4)	2.44	2.13	1.22	182.88	1950	Good
Tennessee Ave. (N. of Central Pier)	Stone groin	2.44	2.13	4.27	43.59	1928	Poor
Between Tennessee Ave. and St. James Place	Central Pier-Timber groin (0.76-m outfall)	----	----	----	----	----	----
St. James Place	Timber groin	2.44	0.61	1.22	147.83	1950	Fair
Illinois Ave.	Timber and stone groin (0.91-m outfall)	2.44	0.61	1.22	182.88	1950	Poor
Arkansas Ave.	0.91-m outfall at N. edge of Million Dollar Pier	----	----	----	----	----	----
Mississippi Ave.	0.61-m double outfall	----	----	----	----	----	----
Florida Ave.	0.61-m outfall	----	----	----	----	----	----
California Ave.	0.91-m outfall	----	----	----	----	----	----
Boston Ave.	0.91-m outfall	----	----	----	----	----	----
Raleigh Ave.	1.5-m sewage pipe extending 457 m to diffuser	----	----	----	----	----	----

[1]Updated from U.S. Army Engineer District, Philadelphia (1974).

Figure 4. Aerial view of Absecon Inlet and Atlantic City (30 April 1973).

between Oriental and Illinois Avenues (Fig. 3). The source of this dredged material has been Absecon Inlet, just inside the Brigantine jetty (Fig. 4) (Everts, DeWall, and Czerniak, 1974).

A detailed discussion of civil works affecting the beaches on Absecon Island is presented by U.S. Army Engineer District, Philadelphia (1974).

3. Beach Material.

New Jersey beaches consist mainly of medium- to fine-grained sand, composed mostly of quartz. The Piedmont and Highlands of the Appalachian Province provide the ultimate source of the beach sands. Presently, due to the low terrain and gentle slopes of the Coastal Plain, the rivers draining the higher areas become sluggish and deposit much of their sediment load along the way before reaching the coast. What little sediment does reach the coast becomes trapped in the lagoons behind the barrier islands, and never reaches the beaches. The only natural sources of beach material now appear to be the ocean floor and the beaches themselves.

Ramsey and Galvin (1977) found the median grain size at Atlantic City to be 0.27 millimeter (1.9 phi), with a sample range of 0.22 to 0.33 millimeter, which agrees with the values obtained from surveys taken in 1936 and 1947 (Beach Erosion Board, 1950). They also determined that the grain size decreased from the north to the south, the direction of net littoral transport. This trend of decreasing grain size from north to south is shown in Figure 5 which indicates the southward decrease in grain size across three profiles at Atlantic City. A spatial trend in grain-size variation from the berm to mean low water (MLW) is also indicated in Figure 6 for the sample averages and in Figure 7 for the profile averages. These plots show an increase in grain size from the berm to MSL, and then a slight decrease from MSL to MLW. A seasonal grain-size variation shown in Figure 8 indicates that the grain size increases from about 0.25 millimeter in October to 0.30 millimeter in December while decreasing from about 0.30 millimeter in December to 0.26 millimeter in March. This trend suggests an increase in the slope of a stable foreshore from October to December when the sizes are increasing and a decrease in foreshore slope when the grain sizes are decreasing from December to March.

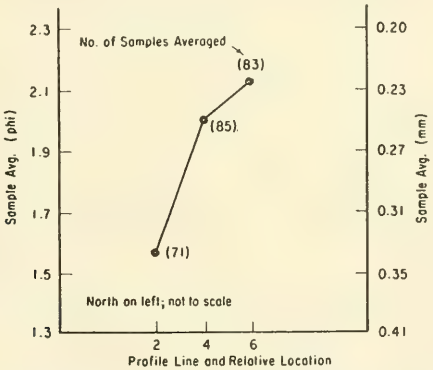

Figure 5. Southward decrease in median grain size at Atlantic City; sample averages are by profile line (from Ramsey and Galvin, 1977).

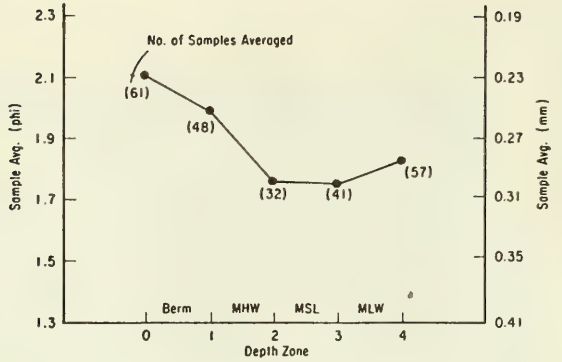

Figure 6. Median grain-size variation across profile at Atlantic City; data consisted of 238 samples collected between January 1968 and March 1969 (from Ramsey and Galvin, 1977).

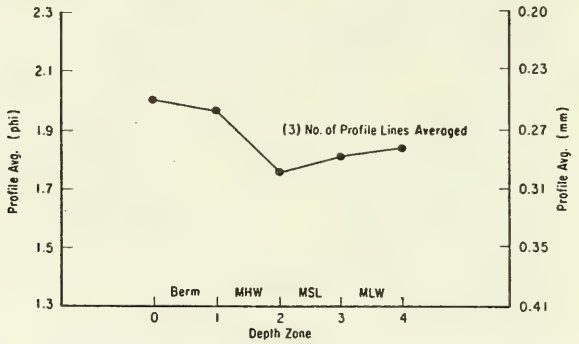

Figure 7. Median grain-size variation across profile at Atlantic City (from Ramsey and Galvin, 1977).

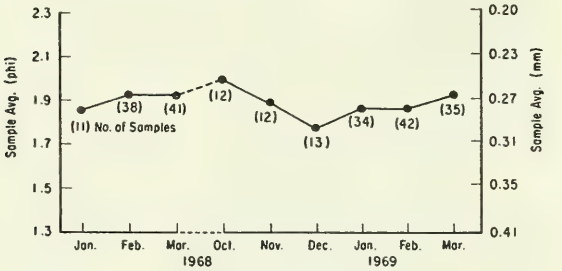

Figure 8. Monthly median grain-size variation at Atlantic City; samples were taken from the berm to below MSL (from Ramsey and Galvin, 1977).

The net littoral transport rate along Absecon Island is estimated to be 115,000 cubic meters annually in a southwesterly direction as determined from estimated gross northerly and southerly annual rates of 191,000 and 306,000 cubic meters, respectively (U.S. Army Engineer District, Philadelphia, 1974). Further evidence for southwest littoral transport is shown by Everts (1975) in the pattern of deposition that decreased the width of Great Egg Harbor Inlet (Fig. 1) 30 percent from 1949 to 1974. Everts also concludes that possibly 25 percent of the longshore transport could be accounted for by sand movement on bars.

Taking into consideration the previously mentioned lack of supply of beach material from natural sources along with the net littoral transport to the southwest, it is obvious that this imbalance of material leaving and entering the area results in erosion of the beaches. These circumstances, in turn, would require occasional beach nourishment to sustain the beach. Two such beach-fill projects were accomplished during the study period, as previously mentioned, with the fill material having a mean grain size of 0.3 millimeter (Everts, DeWall, and Czerniak, 1974). A buildup of sand occurred from 1877 to 1939 on the northern end of Absecon Island, which resulted in the Absecon Lighthouse being so far inland today.

4. Wind, Wave, and Tide Data.

Wind data shown in Figure 9 consist of hourly records obtained before the profile study period by the National Weather Service (NWS) from an anemometer atop the now abandoned Absecon Lighthouse (Fig. 4). Analysis of these data indicates that the predominant wind directions are from the south and west. The corresponding wind velocity from these directions is generally in the 22.5- to 45-kilometer-per-hour range (Fig. 9,b). This agrees with the resultant wind direction determined from data taken 16 kilometers inland at the Aviation Facilities Experimental Station from 1968-72 (Fig. 10). Figure 9,b also shows that most of the high-velocity winds (46.7+ kilometers per hour) were from the northeast. The *resultant* wind direction, as shown in Figure 10, is the magnitude of the vector sum of wind directions, and the average windspeed indicated is the sum of the recorded windspeeds divided by the number of observations.

Winds are from the west-northwest during the winter months of November to March. From March to July the winds shift to the south with a shift back to the west from July to September. After an abrupt shift back to due south in October, the winds return to the west-northwest direction of the winter (Fig. 10).

Data from the Summary of Synoptic and Meteorological Observations (SSMO) (U.S. Naval Weather Service Command, 1970) show the predominant wind directions offshore of Atlantic City throughout the year (Fig. 11). Monthly data indicate that the winter winds of November to March are from the west and northwest, whereas the spring and summer winds of April to August are from the south and southwest. These trends are in general agreement with those indicated above for winds measured inland, except that neither September nor October show directions nearly as predominant as the other months.

The bearing of a line normal to the Atlantic City beach at Steel Pier is approximately 26° east of south. Waves impinging from east of the normal

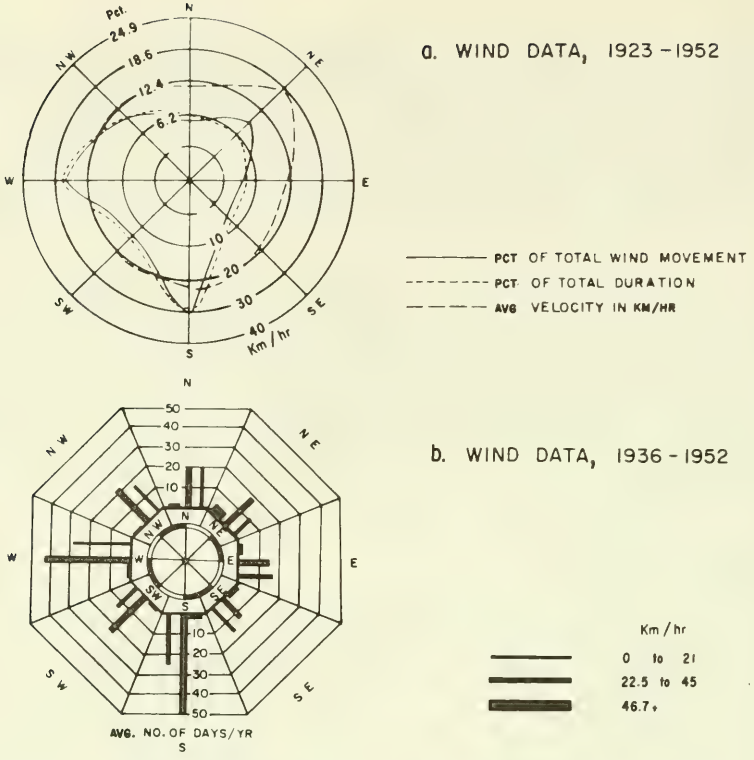

Figure 9. Wind data (yearly averages) for Atlantic City (from U.S. Army Engineer District, Philadelphia, 1974).

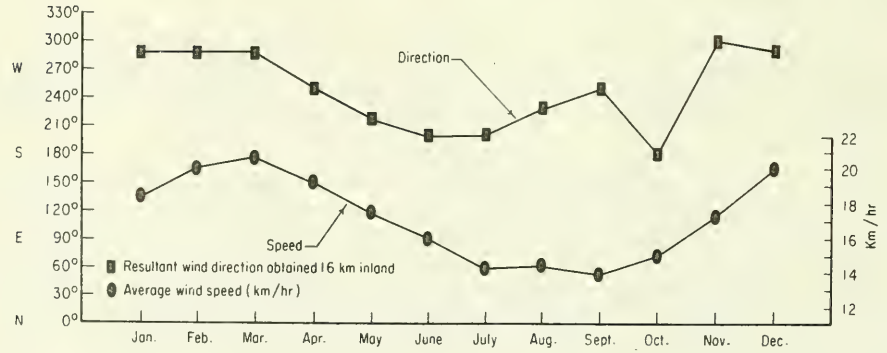

Figure 10. Mean monthly wind speed and direction at Atlantic City (1968-72).

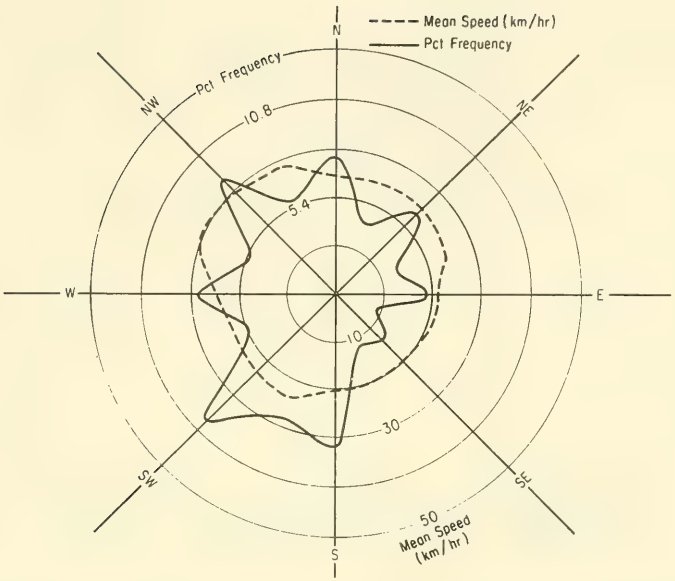

Figure 11. Annual wind distribution by percent frequency and mean speed for Atlantic City. Data obtained from SSMO (U.S. Naval Weather Service Command, 1970) collected during 1949-68 and covering the area from 38° to 40° N. latitude and 72° W. longitude to the coast.

result in a southwest, or "down-beach drift"; waves from west of the normal produce a northeast, or "up-beach drift." Results from visual wave observations obtained at different times at Atlantic City indicate that waves east of the normal occur greater than 50 percent of the time (Figs. 12 and 13). An earlier report by the U.S. Army Engineer District, Philadelphia (1938), also indicated a predominant down-beach drift occurring about 48 percent of the time compared to about 24 percent up-beach drift and 28 percent onshore-offshore drift.

CERC maintained a relay-type wave gage on the end of Steel Pier (5.2 meters mean water depth) from 1962 to 1969, which measured water surface elevations in 6-centimeter increments. These data, analyzed by Thompson (1977), indicate that during 1964 to 1967 the average significant wave height and average wave period increased substantially in September (Fig. 14). This is also in general agreement with Figure 4-10 in the Shore Protection Manual (SPM) (U.S. Army, Corps of Engineers, Coastal Engineering Research Center, 1977). The explanation for this behavior during this particular period is shown in Figures 15 and 16 which give the values by month for each of the years considered. The peak in values of period and height during September 1964 can be attributed to Hurricanes Dora, Ethel, and Gladys offshore along the Atlantic coast. Although none of these hurricanes directly hit New Jersey, they generated large waves which reached the shore. Historically, there is a substantial increase in tropical cyclones and hurricanes in the North Atlantic Ocean during September (Fig. 17); however, only a few

Figure 12. Wave approach at Steel Pier. Length of arrows indicates the percentage of wave approach from the various directions as determined by periodic observations at the end of Steel Pier during November 1935 to May 1937, and July 1947 to March 1948 (from Beach Erosion Board, 1950).

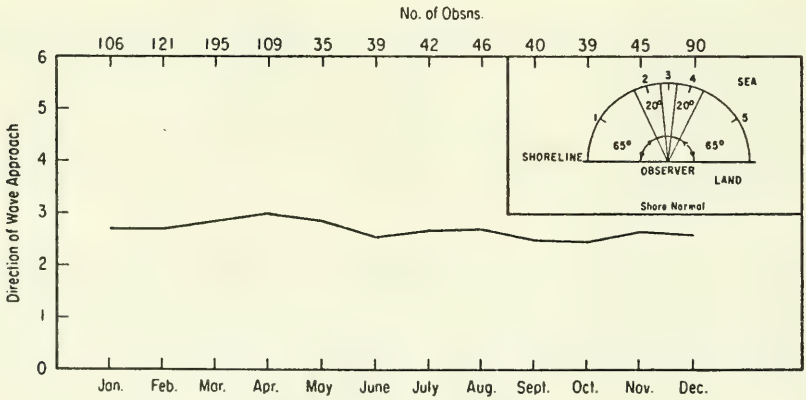

Figure 13. Mean wave direction by month for visual observations obtained from January 1968 to October 1974.

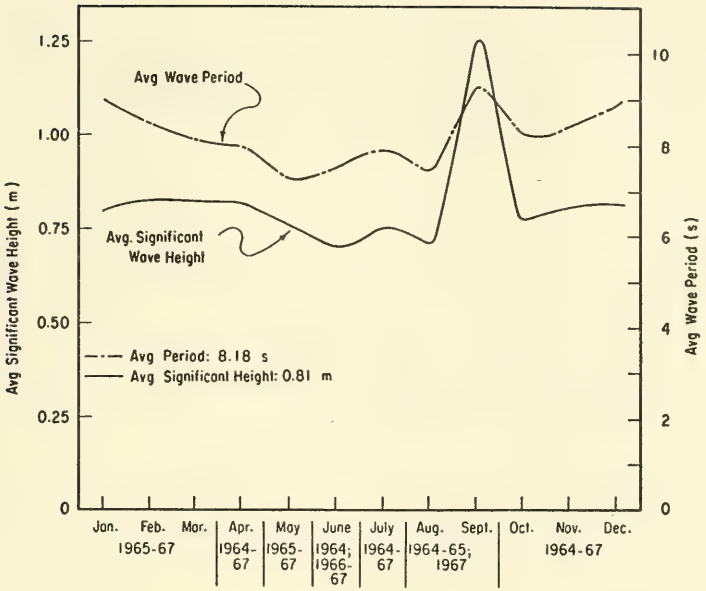

Figure 14. Average significant wave height and average wave period by month from April 1964 to December 1967.

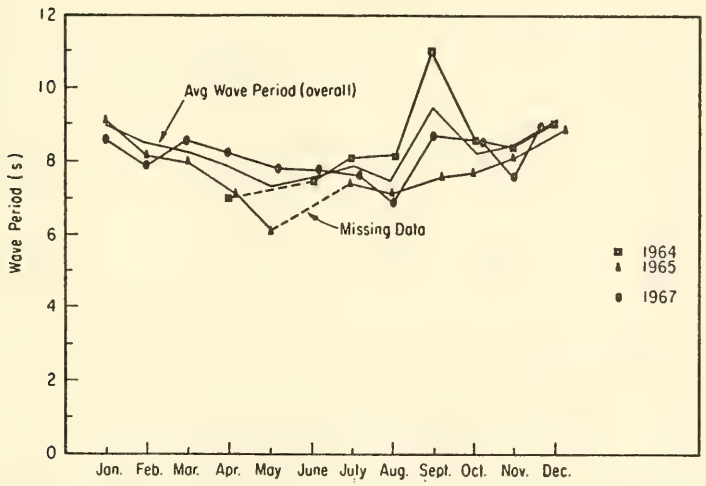

Figure 15. Means of wave periods for Atlantic City; determined from 7-minute pen-and-ink records taken six times daily during 1964, 1965, and 1967 (from Thompson. 1977).

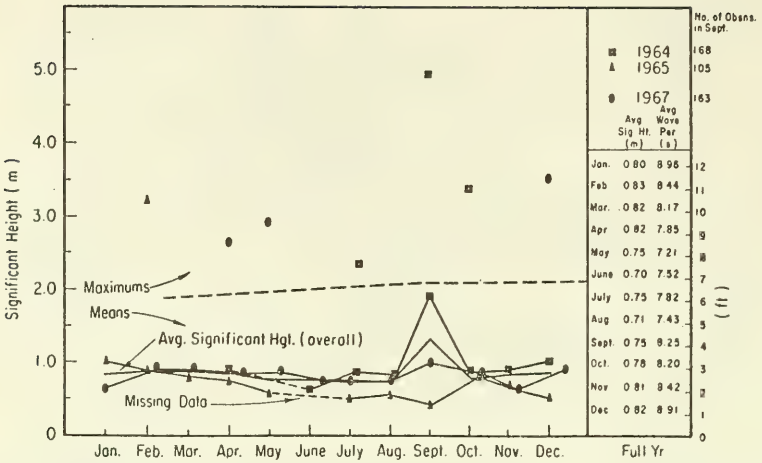

Figure 16. Maximums and means of significant wave height for Atlantic City; determined from 7-minute pen-and-ink records taken six times daily during 1964-65 and 1967. Values for September were obtained by determining the mean from the respective plot for height and period for 1965 and 1967, then weighted by the number of observations during 1964, 1965, and 1967 to arrive at an average for the years 1965 and 1967; all other average values include the monthly values for 1964, 1965, and 1967 (from Thompson, 1977).

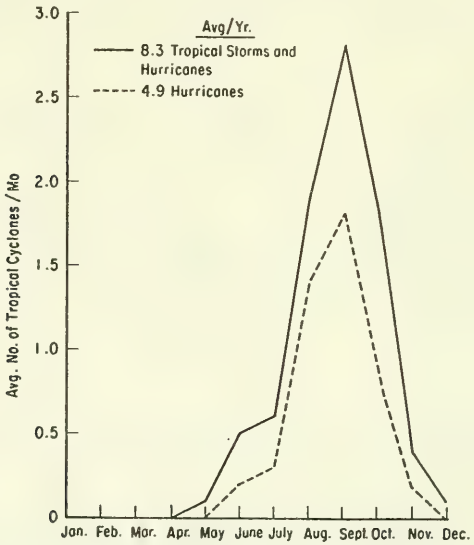

Figure 17. Average number of tropical cyclones occurring per month (1886-1977) in the North Atlantic Ocean (excluding depressions but including subtropical systems) (from National Weather Service, 1978).

hurricanes directly impact on Atlantic City (two "direct hits" from 1899-1977 were recorded by the National Weather Service, 1978). Most hurricanes remain offshore in this area, producing indirect effects such as increased wave heights. Extratropical storms, particularly northeasters, are second only to hurricanes in their destructive intensity causing considerable damage to the beaches and structures along the New Jersey coast. The resultant damage from these storms is largely due to the high winds, waves, and increased water levels they generate.

The astronomical tides at Atlantic City are semidiurnal and have been monitored almost continuously since 1912 from a primary tide station located on Steel Pier. The mean tidal range is 1.25 meters, with the normal tidal range varying from 0.98 meter for neap tides to 1.52 meters for spring tides. The highest recorded storm tide at Atlantic City, 2.32 meters above MSL (Table 2), occurred during a hurricane in September 1944. The March 1962 storm caused the second highest storm tide, 2.19 meters above MSL (Table 2). Additional information on extreme high tides and frequency of maximum monthly high tides is provided in Table 3 and Figure 18, respectively (U.S. Congress, 1964a).

The National Ocean Survey's (NOS) accepted mean tidal heights for this location, based on the timespan 1948 to 1966, referenced to the ocean MLW datum, are: mean high water (MHW), 1.25 meters; mean tide level, 0.62 meter; National Geodetic Vertical Datum (NGVD), 0.50 meter; and MSL, 0.63 meter. During the period 1912 to 1969, the apparent secular trend for the change in sea level at Atlantic City was a rise of 0.283 centimeter per year (Hicks, 1972). Approximately 0.1 centimeter per year of this change is due to the glacial-eustatic rise in sea level, with the remainder attributed to subsidence.

The seemingly minor, but never-ending changes in sea level (Fig. 19), spanning years and decades, are masked by the more dramatic changes due to the meteorological and oceanographic parameters affecting the yearly variability in sea level. These include variations in wind, currents, water temperature, salinity, river discharge, and direct atmospheric pressure (Hicks, 1972).

Table 4 provides a summary of physical characteristics relating to Atlantic City.

III. DATA COLLECTION AND ANALYSIS

1. Establishment of Profile Lines.

Seven profile lines were established along azimuths normal to the shoreline in 1962 (Fig. 1). The spacing between adjacent profile monuments generally increased from profile lines 1 to 7 with the smallest distance between profile lines 1 and 2 at 426 meters, and the greatest distance between profile lines 6 and 7 at 1.62 kilometers. Some of these monuments were, however, offset from the actual profile lines. Standard bronze Corps of Engineers' disks were placed on or near profile lines 1 to 4, and 6 in 1975, and profile lines 5 and 7 in 1976. Each monument was then referenced horizontally to the New Jersey Transverse Mercator and vertically to NGVD (sea level datum of

Table 2. Height of storm tides at Atlantic City.

Yr	Mo	Elevation to MSL (m)
1933	Jan.	1.71
1933	Aug.	1.52
1936	Sept.	1.43
1944	Sept.	2.32
1944	Nov.	1.77
1947	Nov.	1.80
1950	Nov.	2.13
1953	Oct.	1.86
1953	Nov.	1.52
1960	Sept.	1.86
1962	Mar.	2.19
1963	Nov.	1.46
1964	Feb.	1.43
1965	Jan.	1.19
1966	Jan.	1.83
1967	Feb.	1.53
1968	Nov.	1.92
1969	Nov.	1.37
1971	Aug.	2.13
1972	Dec.	1.71

Note--Data for 1933-62 from U.S. Congress (1964a); data for 1963-72 compiled by subtracting predicted tides from recorded tides (NOS) to determine highest for the year.

Table 3. Extreme high tides at Atlantic City (from U.S. Congress, 1964a).

3-yr period	Heights above MSL (m)															
	1.01	1.07	1.13	1.19	1.25	1.31	1.37	1.43	1.49	1.55	1.61	1.77	1.80	1.86	2.13	2.32
	No. of occurrences															
1936-38	205	126	77	44	25	15	7	3	1	--	--	--	--	--	--	--
1939-41	287	194	129	73	34	20	11	8	5	3	2	--	--	--	--	--
1942-44	326	213	143	89	43	28	16	10	8	4	3	2	1	1	1	1
1945-47	338	234	157	99	61	44	19	9	6	3	1	1	1	--	--	--
1948-50	290	189	126	82	46	37	21	11	5	2	2	1	1	1	1	--
1951-53	311	203	130	88	52	30	16	7	4	3	1	1	1	1	--	--
1954-56	344	233	150	98	55	38	19	13	6	1	--	--	--	--	--	--
1957-59	356	231	140	83	56	29	14	7	4	2	1	--	--	--	--	--
1960-61[1]	409	294	213	143	96	66	51	29	18	14	12	3	3	1	--	--

[1]Adjusted by fraction 3/2 to represent a 3-year period for purposes of comparison.

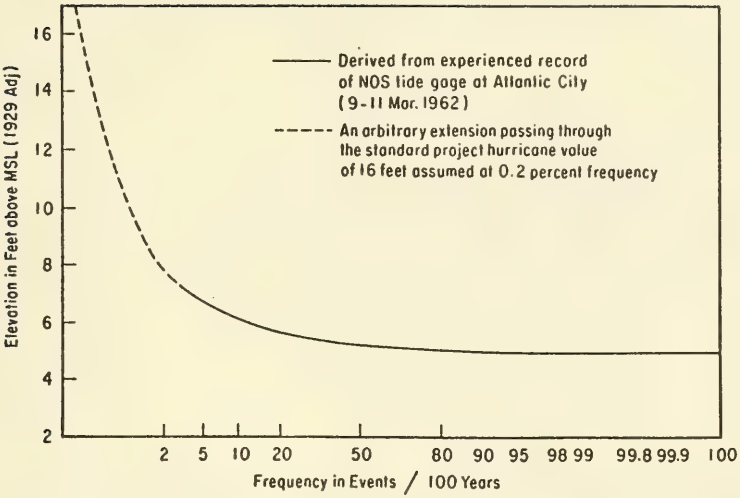

Figure 18. Frequency of maximum monthly high tides at Atlantic City (from U.S. Congress, 1964a).

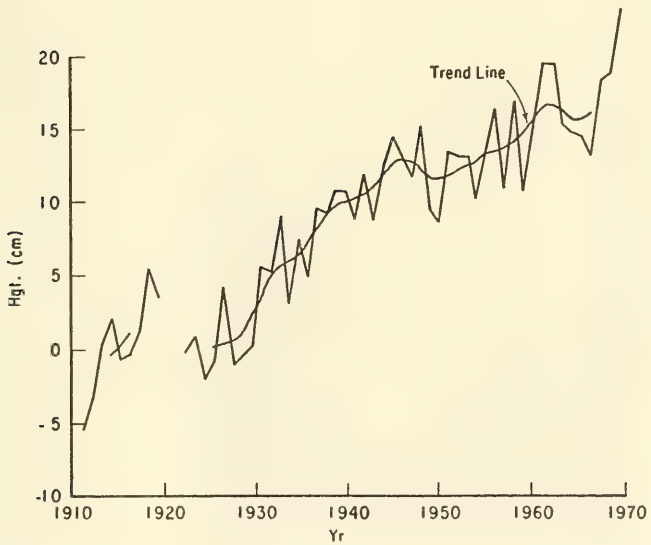

Figure 19. Change in sea level with respect to adjacent land for Atlantic City, 1912 to 1969 (Hicks, 1973).

Table 4. Summary of physical characteristics at Atlantic City.

Characteristic	Description								Source
Location	Absecon Island, 13 km long; coastline orientation of N. 64° E.								
Length of study area	5 km, from Absecon Inlet Jetty SW.								
Mean tidal range	1.25 m								National Oceanic and Atmospheric Administration (1979)
Spring tidal range	1.52 m								National Oceanic and Atmospheric Administration (1979)
Maximum storm surge[1]	2.13 m (Aug. 1971)								National Oceanic and Atmospheric Administration (1972)
Mean significant wave height Standard deviation	0.81 m (less than 1 pct exceed 3 m) 0.53 m								Thompson and Harris (1972) Thompson (1977)
Mean wave period Standard deviation	8.18 s 2.43 s								Thompson and Harris (1972) Thompson (1977)
Breaker type	44.7 pct plunging (PL) 32.0 pct spilling (SP)								Visual obsns. (Jan. 1968 to Oct. 1974)
Breaker approach	57.7 pct within 5° either side of shore-normal 33.0 pct 5° to 25° left of shore-normal								Visual obsns. (Jan. 1968 to Oct. 1974)
Beach material	Fine-to-medium grain quartz sand								Ramsey and Galvin (1977)
Median diameter	0.27 mm								Ramsey and Galvin (1977)
	Profile								
	1	2	3	4	5	6	7	Avg.	
Foreshore slope	0.039	0.066	0.047	0.046	0.046	0.039	0.045	0.047	Everts, DeWall, and Czerniak (1974)
Berm width from Boardwalk (m)	180	5	75	50	60	90	110	80	Everts, DeWall, and Czerniak (1974)
Berm height above MSL (m)	1.3	2.3	3.0	2.4	2.2	2.1	2.0	2.2	Everts, DeWall, and Czerniak (1974)

[1]During BEP program.

1929). All survey work for profile documentation was performed by the U.S. Army Engineer District, Philadelphia. Profile line documentation is discussed further in Appendix A.

2. Frequency of Surveys.

The general criteria considered in establishing survey frequencies were the periods of maximum beach change caused by seasonal effects as well as weather forecasts indicating a high probability of beach erosion due to storms. Survey frequency was greatest during the fall and winter months with a particularly large number of surveys taken during the first quarter of 1963, at the beginning of the project, and in 1968-70 when a series of 10 weekly surveys was done. Figures 20 and 21 show the number of surveys at Atlantic City by quarter (3 months) and by month, respectively.

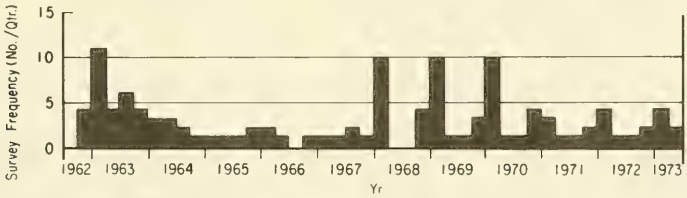

Figure 20. Frequency of surveys at Atlantic City.

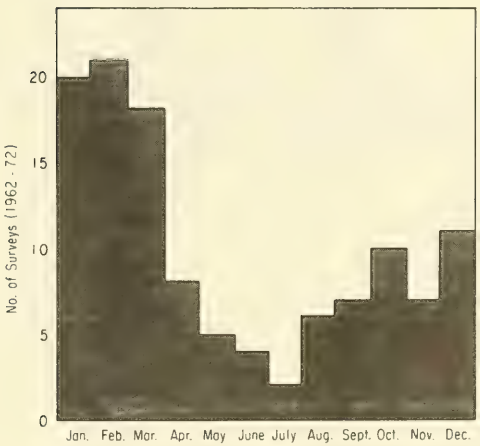

Figure 21. Total number of beach profile surveys, by month, at Atlantic City.

Surveys were initially intended to be conducted every 2 weeks and after significant storms. However, an examination of the initial surveys showed that the engineering significance generally associated with beach changes in a 2-week period was of limited value. Therefore, the interval between regularly scheduled surveys was extended to 1 month or even longer during the summer.

3. Field Survey Technique.

The general data collection procedure consisted of setting up a surveyor's level at or near a previously established point of known elevation or "bench mark," usually located on the seaward side of the Boardwalk (Figs. 22 and 23). Then, using a tape and Philadelphia rod, readings were taken along each profile line at approximately every 15 meters or at breaks in slope. Profile alinement was maintained by sighting on preestablished predominant landmarks such as telephone poles or buildings along the Boardwalk. Horizontal distances were recorded to the nearest 0.3 meter and elevations to the nearest 0.03 meter, except when hand leveling was used.

Figure 22. Surveying crew setting up for another reading (16 January 1968).

When the Philadelphia rod reached an elevation where it was out of view through the level, the general procedure was to hand level down to the surf with the rodman wading out as far as possible. Occasionally, the rod was "boosted" (or raised) a known distance to the top of the rodman's boot or belt to obtain the last point without hand leveling. Turning points were also used; however, before 1972 the leveling was not closed back to either the turning points or to the starting bench mark, so the reliability of the turning points could not be determined.

The surveying party consisted of a six-man hydrographic surveying crew from the Philadelphia District, except for a period in 1963 and 1964 when a private firm was contracted to do the work. The six-man crew either worked as

Figure 23. Rodman in the surf (16 January 1968).

a single crew or split into two three-man crews to expedite the work. The crew also collected sand samples at various times at selected profile lines.

In addition to surveys by conventional surveying methods, an experimental program was conducted to test a method of obtaining profiles by observing sand levels on pipes located at approximately 15-meter intervals along selected profile lines (Urban and Galvin, 1969). Profile lines 5 and 7 at Atlantic City were selected for this program.

To establish the pipe profiles, 6.4-meter-long iron pipes (marked at 0.15-meter intervals and usually marked before emplacement) with 3.8-centimeter (inside) diameters were jetted 4 meters into the sand. A type of reflecting material or a sign was displayed on the pipes as a safety measure for beach buggy traffic at night.

Unpaid local observers enlisted by the Philadelphia District made weekly observations of the sand elevation at each pipe. These observations were recorded on forms and mailed weekly to CERC. At CERC, the sand elevations were converted to elevations above MSL and the data were stored in the standard survey format. These data are available in Urban and Galvin (1969).

4. Accuracy of Field Surveys.

A certain degree of error is inherent in any data collection procedure, even under the most ideal conditions. Some of the possible errors encountered throughout these surveys are discussed below.

Random reading errors were minimized by using a rod graduated in tenths of a foot. Since the only readings requiring a greater precision (to the nearest hundredth of a foot) were at the bench mark and at turning points, and these sight lengths were usually less than 76 meters (250 feet), no significant random error should occur (Czerniak, 1972).

Systematic errors due to condition of the level, rod out of plumb, temperature of tape, slope of tape, and tape not on line were considered insignificant and had no great effect on the data collected. Bad turning points undoubtedly resulted in some error, but since the leveling was not closed back to the bench mark, there is no definite method of determining specifically when an error might have occurred or to what extent. Another source of systematic error results from the sag of the tape and wind effects on taping. The magnitude of this error is assumed to be an average maximum of -0.1 foot per 200 feet of tape length.

Taking into account these error possibilities and various other errors due to human and environmental causes, the data were considered "accurate" if every point on the profile was within ±0.05 foot vertically and ±0.5 foot horizontally of the actual values. The data were also considered "dependable" if sufficient checks on the survey data were performed to ensure that no personal errors affected the data. Based on these criteria, it was concluded that the data obtained were of acceptable accuracy and dependability.

5. Data Reduction and Quality Control.

Until 1968, survey data were recorded in field notebooks, reduced and hand-plotted by the surveyors, and then forwarded to CERC. These plots were later digitized and placed in a punchcard format. After 1968, the survey data were still recorded in fieldbooks, but the data were then transferred to optical scanning forms before being sent to CERC. At CERC the data were logged and scanned with an optical mark page reader (OMPR) to produce punchcards. The cards were then read into a computer where the data were processed using an editing program which plotted profile points. From these plots, apparent errors were identified and returned to the surveyors for correction or comment. A final edit check was made and the data were stored in a magnetic-tape format when all detectable errors were satisfactorily corrected.

A quality control study by Czerniak (1973) indicated a 25 percent probability that there would be an error of ±0.1 foot in the recorded elevation of a surveyed point due to rounding by the survey party in the field. Because of the improbability of this rounding error occurring numerous times on the same profile, this error, if present, should have no adverse affect on any data analysis.

Figure 24 diagrams the basic steps taken throughout the BEP program from the initial observation in the field to the final computer output.

Appendix B provides a tabulation, by profile, of all the survey data collected during the study.

6. Data Analysis.

Two primary parameters calculated from the profile data are (a) the change in MSL shoreline (ΔS) and (b) the change in unit storage volume (ΔV). The first parameter, ΔS, is the horizontal change, between surveys, of the position of MSL at a profile line. If the beach at MSL prograded during the time between surveys, a positive number would result for ΔS; a negative value would result if the beach receded. The second parameter, ΔV, is the change in volume above MSL between two surveys for a unit width parallel to the shoreline at a profile line. If accretion occurs between surveys, ΔV will have a positive value, and if erosion occurs, ΔV will be negative.

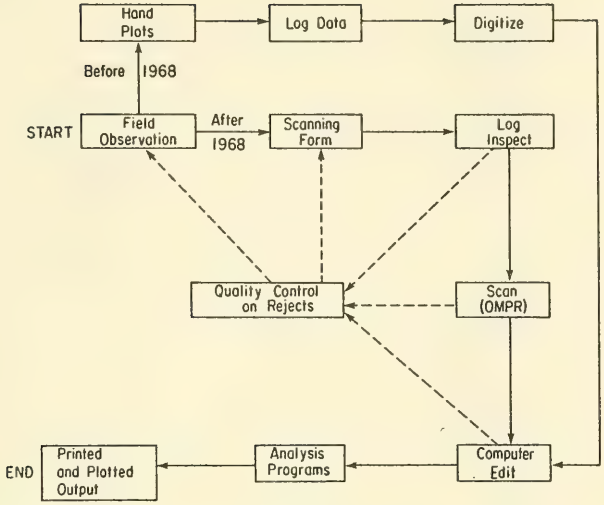

Figure 24. BEP data processing.

The values for ΔS and ΔV are limited in two significant ways (see Figs. 25 and 26). The lower limiting elevation of the surveys for computational purposes is MSL and therefore the values do not provide any indication of changes below MSL. The volume computations are also based on a landward boundary, common to most of the surveys, for each profile line. As a result of these two limiting factors, there generally exists a landward region of change as well as the probably more substantial below-MSL region of change which are not included in the computed volume.

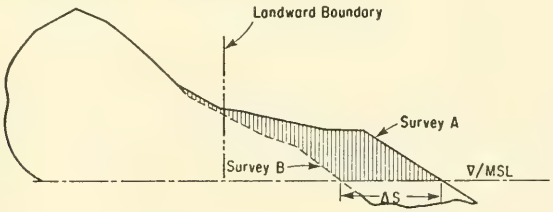

Figure 25. Change in MSL shoreline at profile line, ΔS.

IV. RESULTS

1. Short-Term Changes.

a. Changes During Storms. Storms contribute substantially to short-term beach profile changes by their very nature of short duration and high

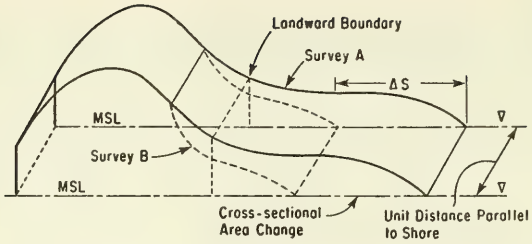

Figure 26. Change in unit storage volume at profile line, ΔV.

intensity. Seventeen storms, predominantly northeasters, were selected for analysis based on the following criteria (see Table 5):

(1) Existence of prestorm surveys no more than 4 weeks before the storm and poststorm surveys no more than 1 week after the storm;

(2) data indicating wave heights of 1.22 meters or greater during the storm (this value was arbitrarily chosen due to the 0.85-meter value for mean wave height determined by Thompson and Harris, 1972); and

(3) no other known significant weather events occurring between surveys.

Visual observations indicate that the predominant breaking wave directions during storms are from the east and southeast. Wave breaker types most commonly observed were either plunging or spilling (Urban and Galvin, 1969). Analysis of the selected storms for which actual tide data were available demonstrated an average maximum storm-generated surge at high water of 0.57 meter.

An effect which must be considered is the timelag between the storm and the poststorm survey which varies from 0 to 6 days. The greater the lag, the more probable that the beach has already begun recovering, thereby not indicating the total storm change (Birkemeier, 1979). (See App. C for plots of prestorm and poststorm surveys.)

Figure 27 depicts the mean and standard deviation of unit volume changes above MSL, by profile, for the selected storms. Due to the relatively few storms analyzed, this information provides only a possible trend of unit volume changes at each profile line. Profile lines 2, 5, 6, and 7 underwent the greatest average unit volume loss of 6 cubic meters per meter or greater during these storms. This is partly explained by the fact that the general direction of longshore transport during storms is from northeast to southwest in this area. Consequently, profile lines 2 and 5 are in littorally depleted locations as a result of updrift groins and other manmade obstructions to littoral drift (see Fig. 3). However, profile lines 6 and 7 are on relatively unobstructed beach, so their changes in unit volume are presumably due to onshore-offshore sand movement, or possibly movement downshore into the unsurveyed part of Absecon Island.

The wide deviation at profile line 1 is undoubtedly a direct consequence of its location immediately downdrift of the Absecon Inlet jetty. Profile line 4, on the other hand, indicates a zero average unit volume change in

Table 5. Atlantic City storm data.

Storm date	Survey dates	Days before survey (No.)	Days after survey (No.)	Max. HW surge (m)	Max. HW surge (ft)	Dates of max. HW surge	HW surges ≥0.61 m	HW surges ≥0.3 m	Max. wave hgt. (m)	Max. wave hgt. (ft)	Source	Dates of max. wave hgt.	MSL shoreline chg. avg.[1] (m)	MSL shoreline chg. std. dev. (m)	Above MSL unit vol. chg. avg.[1] (m^3/m)	Above MSL unit vol. chg. std. dev. (m^3/m)
13 Jan. 1964	31 Dec. 1963 to 17 Jan. 1964[2]	13	4	0.66	2.17	13 Jan. 1964	1	3	3.96	13.00	Gage	----------	2.72	4.89	-20.40	25.23
23 Sept. 1964	31 Aug. to 25 Sept. 1964[2]	23	2	0.23	0.77	22-23 Sept. 1964	0	0	4.88	16.00	Gage	----------	-2.68	12.99	-22.99	22.07
16 Sept. 1967	15-19 Sept. 1967	1	3	0.73	2.38	16 Sept. 1967	1	2	2.74	9.00	Gage	----------	-5.90	10.70	-8.18	25.63
25 Jan. 1968	24-30 Jan. 1968	1	5	0.54	1.78	25 Jan. 1968	0	3	1.22	4.00	Visual	26 Jan. 1968	0.14	5.11	-5.82	9.56
8 Feb. 1968	30 Jan. to 8 Feb. 1968[2]	9	0	0.66	2.18	8 Feb. 1968	1	1	1.98	6.50	Visual	8 Feb. 1968	-0.27	4.48	-6.02	7.86
25 Feb. 1968	21-26 Feb. 1968	4	1	0.24	0.78	25 Feb. 1968	0	0	1.22	4.00	Visual	25 Feb. 1968	-5.90	13.19	-0.32	5.93
1 Mar. 1968	26 Feb. to 7 Mar. 1968	4	6	0.63	2.08	29 Feb. 1968	1	1	1.83	6.00	Visual	1 Mar. 1968	1.83	11.00	1.88	3.35
13 Mar. 1968	7-13 Mar. 1968	6	0	0.45	1.48	12 Mar. 1968	0	1	1.83	6.00	Visual	8 Mar. 1968	-4.90	8.19	-2.33	9.75
									2.93	9.61	Gage	20-25 Jan. 1969	-----	-----	-----	-----
22 Jan. 1969	13-22 Jan. 1969	9	0	0.38	1.26	21 Jan. 1969	0	3	1.52	5.00	Visual	21-22 Jan. 1969	-3.83	8.33	-12.64	9.52
									1.74	5.70	Gage	9 Feb. 1969	-----	-----	-----	-----
10 Feb. 1969	5-12 Feb. 1969	5	2	0.51	1.66	9 Feb. 1969	0	1	1.22	4.00	Visual	9 Feb. 1969	-2.03	5.17	0.73	7.19
18 Feb. 1969	12-19 Feb. 1969	6	1	0.48	1.56	18 Feb. 1969	0	4	1.52	5.00	Visual	18-19 Feb. 1969	0.40	6.24	-5.48	11.10
									1.22	4.00	Visual	28 Feb. 1969	-----	-----	-----	-----
2 Mar. 1969	26 Feb. to 5 Mar. 1969	4	3	0.75	2.46	2 Mar. 1969	3	10	2.73	8.96	Gage	27 Feb. to 3 Mar. 1969	6.99	8.65	-11.01	23.96
									1.67	5.48	Gage	7-8 Mar. 1969	-----	-----	-----	-----
7 Mar. 1969	5-12 Mar. 1969	2	5	0.48	1.56	7 Mar. 1969	0	3	1.22	4.00	Visual	7-8 Mar. 1969	-3.43	7.17	5.10	11.30
11 Dec. 1969	20 Nov. to 16 Dec. 1969	21	5	No tide data	No tide data	----------	---	---	1.37	4.50	Visual	9 Dec. 1969	0.80	10.16	2.33	14.11
17 Dec. 1970	9-18 Dec. 1970[2]	8	1	0.91	3.00[3]	----------	---	---	3.35	11.00	Gage	17 Dec. 1970	3.60	10.14	-1.21	30.70
19 Feb. 1972	14-22 Feb. 1972	5	3	1.07	3.50	19 Feb. 1972	1	5	2.13	7.00[4]	Visual	19 Feb. 1972	2.64	6.89	-14.83	14.39
22 Mar. 1973	16-25 Mar. 1973[2]	6	2	0.78	2.57	22 Mar. 1973	4	8	1.37	4.50[4]	Visual	22 Mar. 1973	11.80	7.47	-11.60	25.23
Avg.		7.47	2.53	0.57	1.88		0.8	3	2.08	6.33						

[1] Simple average of profile values (negative values indicate recession-erosion).

[2] Not all profiles reached MSL.

[3] Data from Sandy Hook, New Jersey.

[4] Data from Ludlam Island, New Jersey.

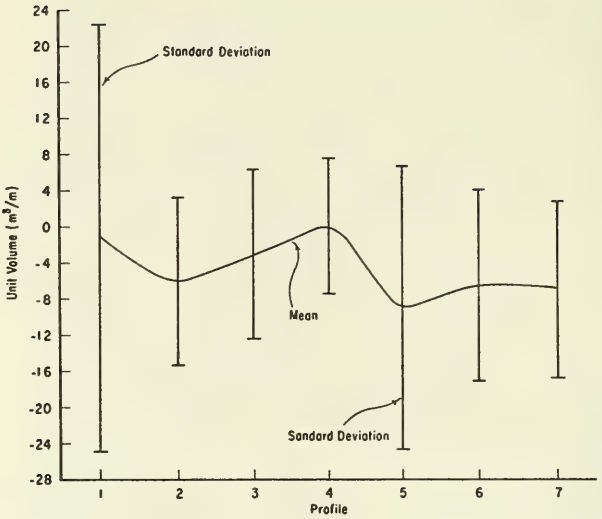

Figure 27. Mean and standard deviation of unit volume changes by profile for 17 selected storms at Atlantic City.

addition to having the smallest deviation of all profiles. Profile line 4, therefore, appears to maintain a reasonably stable unit volume throughout storms. This apparent anomaly may possibly be related to the number and type of structures near the profile; i.e., Steel Pier and Steeplechase Pier updrift of the profile, as well as two groins located on either side of Steel Pier (Table 1). In addition, another groin located just downdrift of the profile causes a "boxed-in" effect which could possibly contain a bulk of the littoral material.

Figure 28 illustrates the mean unit volume changes and standard deviations by contour above MSL for all profile lines during the selected storms. The greatest average unit volume loss occurs between the +0.5- and +1.0-meter contours. The figure also shows that the greatest deviations from the mean occur between the 0.0- and +2.0-meter contours. This is to be expected because wave action is concentrated in the foreshore region and thereby lends to greater variations in volumes of material moved. Also, it is possible that the maximum average unit volume loss occurs between the +0.5- and +1.0-meter contours because the average maximum surge above high water, which allows waves to concentrate, during those storms is 0.57 meter. Alternately, the variation in volume change generally decreases with increasing elevation above +2.0 meters because this part of the profile remains relatively stable, except in severe storms, due to its increased distance from the scouring effects of wave action. This higher part of the beach not only remains relatively stable, but it accretes an average of 0.21 cubic meter per meter per storm between the 3.0- and 3.5-meter contours.

Since losses from the lower contours clearly exceed gains along the upper contours, sand is moving either offshore or alongshore. The most intense storms resulted in -20 cubic meters per meter volume changes above MSL, which

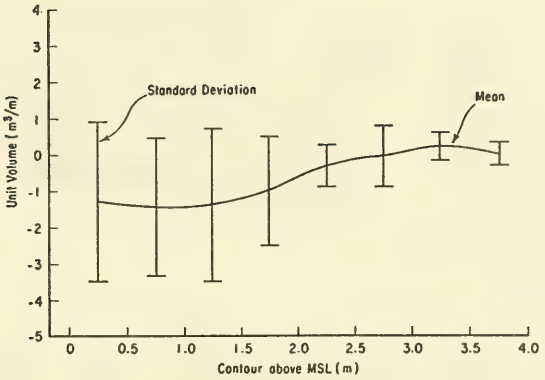

Figure 28. Mean and standard deviation of unit volume changes by contour for 17 selected storms at Atlantic City profile lines.

is -100,000 cubic meters over the 5-kilometer study area compared to the gross annual longshore transport rate of about 500,000 cubic meters (for the entire littoral zone); this short-term beach erosion indicates that most of the sediment transport during storms is offshore.

In Figure 29 the unit volume changes at each profile, as determined from prestorm and poststorm survey data, are compared to the changes in MSL shoreline position (0.0 contour) for the same storm data. In this way, volume changes resulting in accretion and erosion are compared to shoreline changes resulting in progression (advancement) and recession (retreat). Figure 30, which depicts trends in volume change versus shoreline change for selected storms, shows considerable differences between these two values, indicating, at least during storms, that volume accretion is not necessarily accompanied by MSL shoreline progression nor is volume erosion always accompanied by MSL shoreline recession. These data demonstrate the need for caution when evaluating short-term beach changes from aerial photos.

b. Beach-Fill Changes. Two major beach-fill projects at Atlantic City during the BEP study (in 1963 and 1970) used a combination of stockpiling and direct placement. Stockpiling entails periodically placing beach material at a concentrated updrift location in the depleted area, and allowing natural processes to move the fill downdrift to nourish the beach. Direct placement involves placing the fill along the entire area to be nourished.

As mentioned previously, the 1963 fill project consisted of 428,000 cubic meters of fill placed between Oriental and Virginia Avenues to replenish the greatly eroded beach resulting from the March 1962 storm. Figures 31 and 32 indicate the 1963 and 1970 beach-fill limits and the beach profiles before and after both fills. Figure 33 shows the unit volume change from 1963 to 1972 for each profile line. These data indicate that the 1963 fill remained for approximately 4 years on profile line 3 and provided nourishment to profile lines 4 to 7 at later times as a result of natural processes, as indicated by the dashline tracing volume increases along the profile lines. However, those same natural processes caused a continued erosion problem that required the

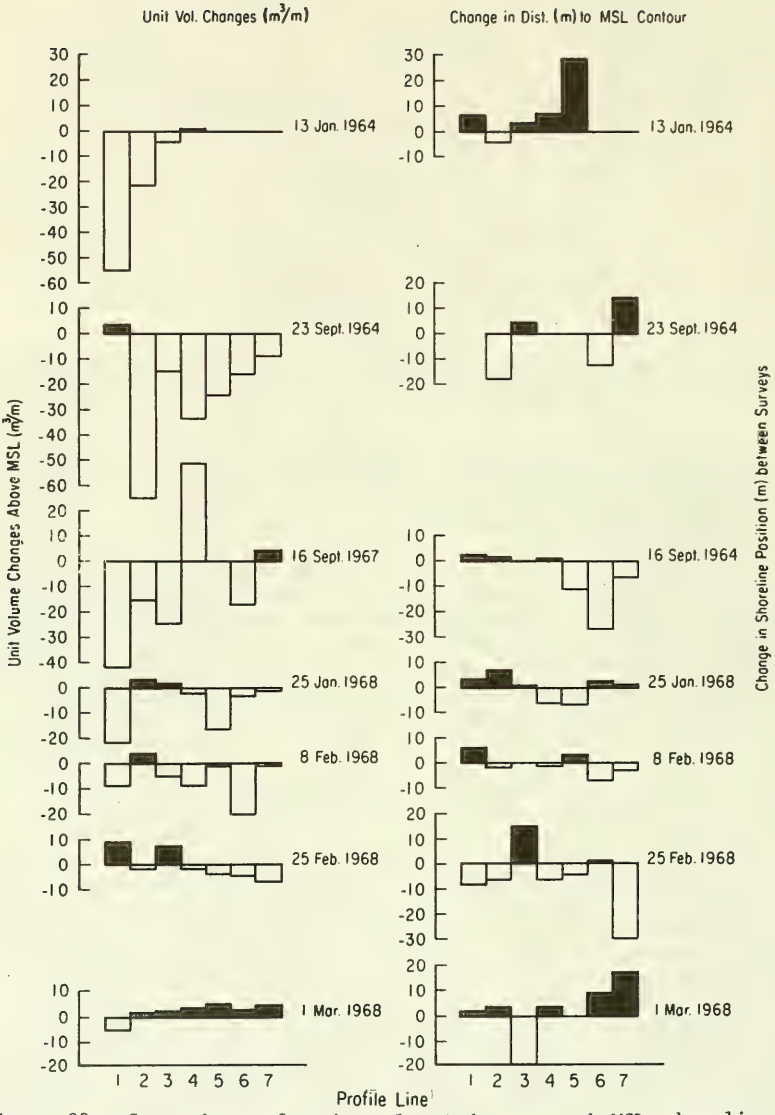

Figure 29. Comparison of unit volume changes and MSL shoreline position changes by profile for 17 selected storms.

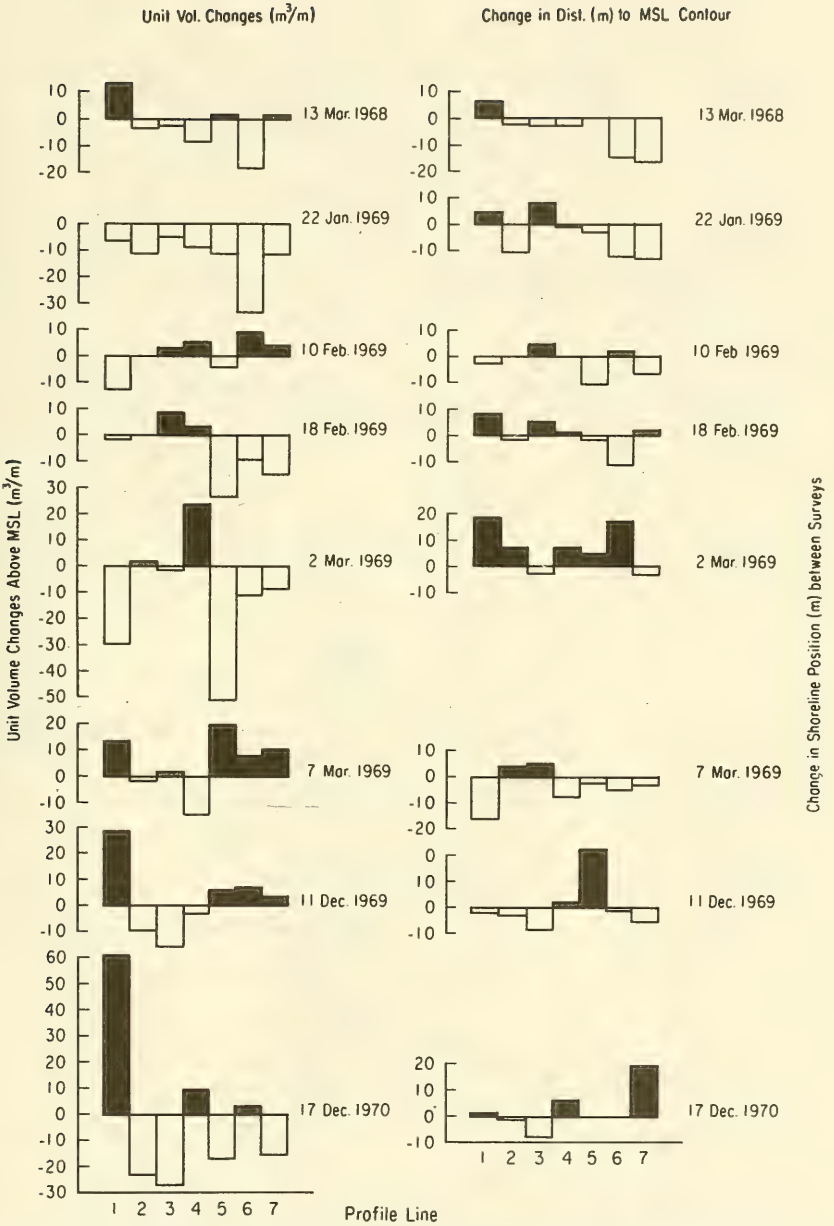

Figure 29. Comparison of unit volume changes and MSL shoreline position changes by profile for 17 selected storms.--Continued

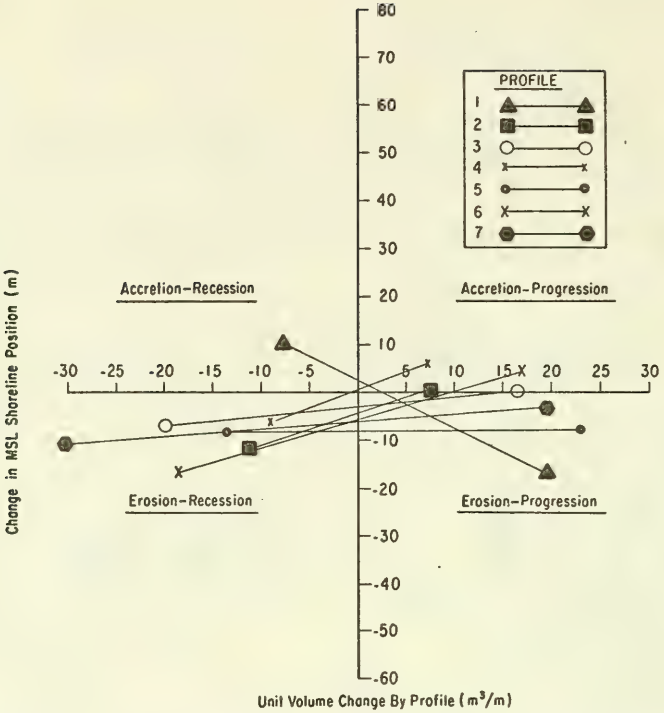

Figure 30. Trends in volume change versus shoreline change for 17 selected storms.

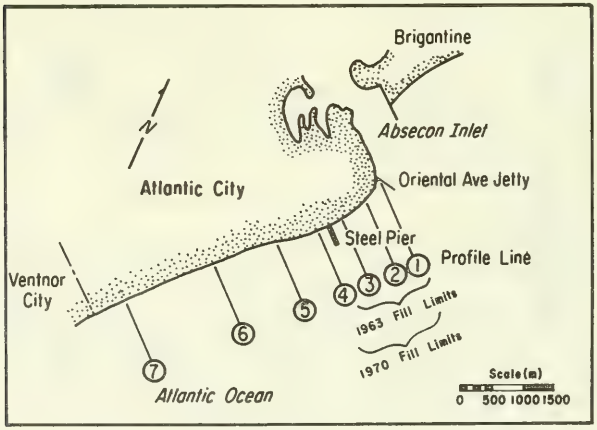

Figure 31. Limits of 1963 and 1970 beach fills at Atlantic City (Everts, DeWall, and Czerniak, 1974).

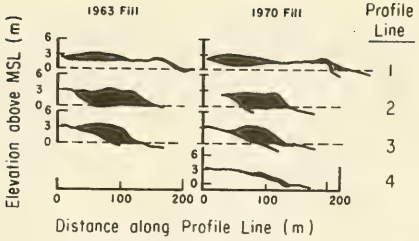

Figure 32. Cross section of beach from profiles taken before and after beach nourishment in 1963 and 1970 (from Everts, DeWall, and Czerniak, 1974).

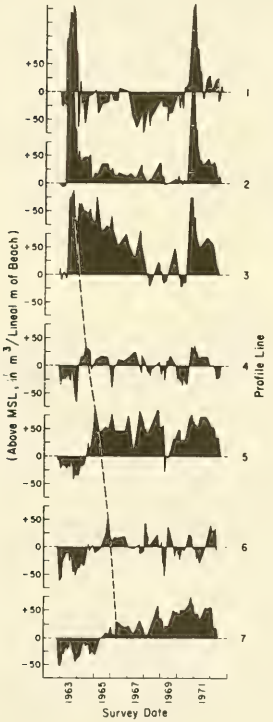

Figure 33. Sediment volume measurements between surveys relative to first survey ("zero" unit volume is the volume during the first survey in October 1962). Dashline indicates probable alongshore movement of some volume of the beach fill as determined by volume increases along profile lines 4 to 7 (Everts, DeWall, and Czerniak, 1974).

placement in 1970 of an additional 635,000 cubic meters of beach material between Oriental and Illinois Avenues (see Figs. 31 and 32). The fill material in each case was similar to the natural beach material, with a mean grain size of 0.3 millimeter. Again in 1970, profile line 3 indicated a trend to maintain much of the fill for an extended time period (Fig. 33). Although surveys were not conducted after 1973, it can be assumed that some of the fill migrated down the beach to the other profile lines as did some of the 1963 fill. Some information supporting this assumption is shown by comparing the photos in Figures 34 and 35 (taken in November 1970) with the photos in Figures 36, 37, and 38 (taken in March 1979 at profile line 2). Note the considerable amount of beach after the beach fill in 1970, compared to the practically nonexistent beach in 1979. Also, note the wide beach in Figure 39 (taken at profile line 6 in March 1979) compared to the lack of beach in Figures 36 and 37.

Figure 34. View of scarp just north of profile line 2 (24 November 1970).

Figure 35. View landward from waterline at profile line 2. Building at left, behind Boardwalk, is convalescent home shown in Figure 38 (24 November 1970).

Figure 36. View of groin at Vermont Avenue from under the Boardwalk at Rhode Island Avenue (profile line 2) (9 March 1979).

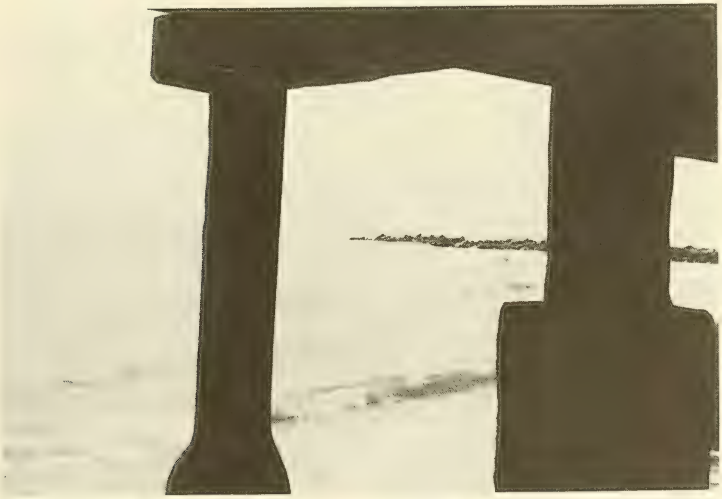

Figure 37. View of groin south of Rhode Island Avenue from under the Boardwalk at profile line 2 (9 March 1979).

Figure 38. View of erosion-scour at the base of the convalescent home on the south side of Rhode Island Avenue (8 March 1979).

Figure 39. Looking shoreward from waterline at California Avenue (profile line 6) on 9 March 1979. Note width of beach compared to that at profile line 2 in Figures 23 and 34.

Additional short-term changes that primarily affect the upper sections of the profiles result from the periodic removal of sand from under the Boardwalk (see Figs. 40, 41, and 42) for use as fill elsewhere on the beach (see Fig. 43). Although this procedure has been observed, it is not well documented in terms of frequency or quantities of material transferred. The project during the winter and spring of 1979 was done by the City and called for the removal of 36,600 cubic meters of sand from under the Boardwalk near profile line 7 (Richmond to Raleigh Avenues) (M. Ingram, City Engineer, personal communication, March 1979). This material was then placed on the foreshore midway between profile lines 4 and 5. Because of the relatively fine size of this well-sorted sand (0.18 millimeter compared with 0.27 millimeter reported by Ramsey and Galvin, 1977, for average foreshore sand size in March), the material would probably be easily eroded from the beach face.

Figure 40. Borrow site under Boardwalk at Richmond Avenue on 9 March 1979. Note amount of sand removed by comparison to sand still evident behind and under Boardwalk (compare also to Fig. 39).

Figure 41. Trucks waiting to be filled with sand near Raleigh Avenue (9 March 1979).

Figure 42. Front loader filling truck with sand excavated from under the Boardwalk near Raleigh Avenue (9 March 1979).

Figure 43. Site of beach fill near St. James and New York Avenues (9 March 1979).

2. Long-Term Changes.

Long-term changes include the cyclic seasonal changes (U.S. Army, Corps of Engineers, Coastal Engineering Research Center, 1977) along with longer range trends which may or may not be cyclic in nature. Changes in the MSL shoreline position during 1962-73 are shown in Figure 44. The 1963 and 1970 beach fills are evident on profile lines 1, 2, and 3 with subsequent progradation on the downdrift profiles, which was also shown in the unit volume changes (Fig. 33). Figure 45 depicts the average unit volume and MSL shoreline position by month for each of the profile lines. The mean of the monthly averages for each profile is indicated by the "zero" unit volume, whereas the "zero" MSL shoreline position is the shoreline position during the first survey. Figure 45 shows that seasonal changes do occur at Atlantic City, with the least volume of sand on the beach from January to March and the greatest volume of sand generally from June to August. This large quantity of sand also appears predominantly on profile lines 1, 2, and 3 with profile lines 5, 6, and 7 showing a loss of sand during June and July. These extremely large volumes at profile lines 1, 2, and 3 predominantly reflect the beach fill of 1963 in which the bulk of the fill material was placed along these profile lines as shown in Figure 32. These values may also be misleading since only four surveys were conducted in June and two in July throughout the 11-year study period, with each of the profile lines surveyed twice during June, July, and August of 1963 after the 1963 beach fill. June and July were the least surveyed months during the study period (Fig. 21). In addition, all profile lines were surveyed in August 1970 after the 1970 beach fill, thereby adding a bias to the six surveys conducted in August throughout the study. Therefore, the information for these months is less representative of average summer conditions.

To evalute the entire Atlantic City locality as a whole, ΔS and ΔV were averaged by year in the alongshore direction. The averaged alongshore change in MSL shoreline, $\Delta \bar{S}$, is computed by summing the alongshore distance-weighted yearly average values of ΔS at each profile line and dividing by the total length of the study area. Similarly, the averaged alongshore change in storage volume, $\Delta \bar{V}$, is computed using the alongshore distance-weighted values of ΔV (Czerniak, 1974).

A comparison of the mean yearly changes in storage volume and MSL shoreline (Fig. 46) shows that the long-term trends are influenced more by the *magnitude* of the accretion-erosion and progression-recession occurring in these years than by the *number* of net accretionary or erosional years. This is clearly indicated by the high dependency on the two artificial beach fills in 1963 and 1970 for the shape of the cumulative yearly change in storage volume, $\Delta \bar{V}$ (Fig. 46). In conjunction with this, yearly changes in the MSL shoreline and storage volume vary considerably and appear to suggest no clear pattern.

Figure 47 shows the changes in unit volume and shoreline position for the years between the beach nourishment projects in 1963 and 1970. The slope of a least square fit line drawn through the points on the plot of cumulative average yearly change in storage volume for the seven profile lines (Fig. 47) provides a single number which best describes the rate of "natural" change in the above MSL storage volume during this period. The line only provides a general description of the trend in the data due to the wide yearly variation

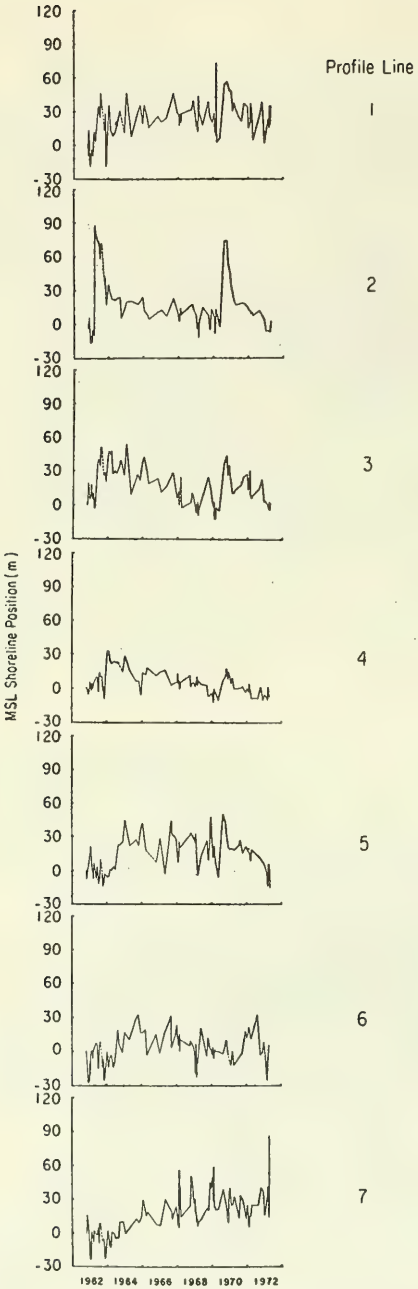

Figure 44. MSL shoreline changes in time (missing data shown by dashline).

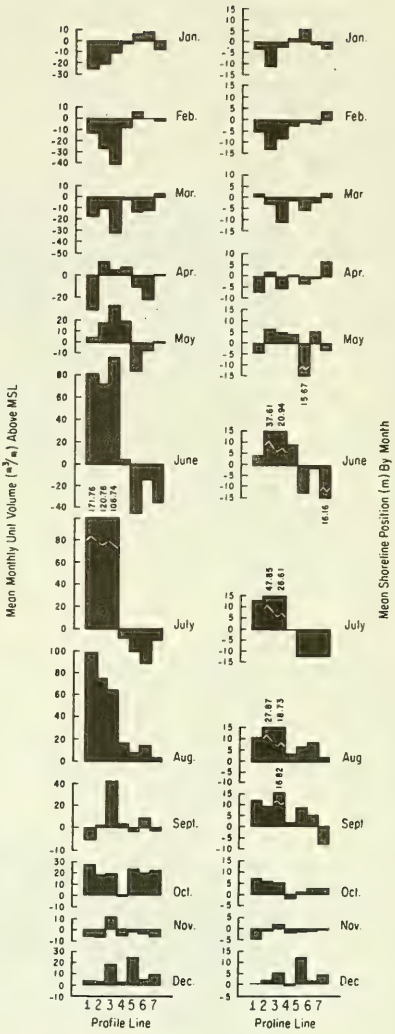

Figure 45. Mean above MSL unit volume changes and MSL shoreline position changes by month (24 October 1962 to 1 May 1973).

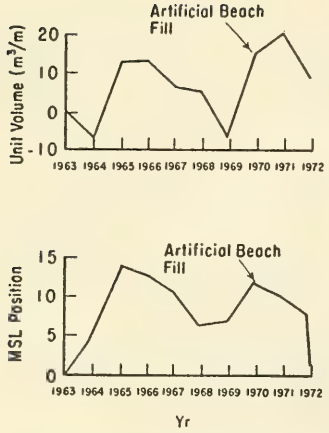

Figure 46. Cumulative yearly change in unit volume and MSL shoreline at Atlantic City.

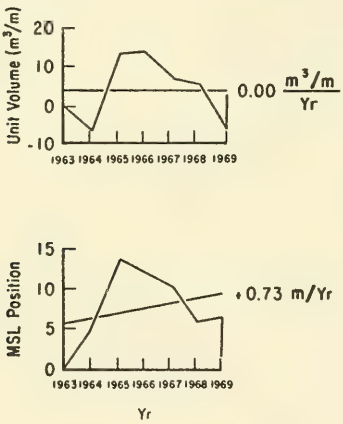

Figure 47. Long-term changes in unit volume and MSL shoreline from 1963-69 to eliminate effects of 1970 beach fill.

(Fig. 33). Under these conditions, Figure 47 indicates that Atlantic City has remained stable at 0.00 cubic meter per meter per year change above MSL during the period from 1963 to 1969.

Applying the same procedure to the change in MSL shoreline over the same period, the rate of change in the MSL shoreline indicates a progression of 0.73 meter per year. However, this line likewise represents only a general trend and only roughly approximates the actual rates of change in MSL shoreline for the locality.

Further information on the MSL shoreline changes and the above MSL unit volume changes through time by profile line is provided in Appendixes D and E, which are large-scale figures by profile of Figures 44 and 33, respectively.

V. DISCUSSION

1. Profile Changes.

In a study by the Beach Erosion Board (1950), various shoreline positions from 1841 to 1947 were compared to determine a trend in shoreline advance and retreat along the beaches at Atlantic City. It was found that considerable shoreline retreat occurred at the inlet entrance from 1841 to 1936. After 1936 the inlet shoreline remained reasonably stable due to the installation of protective structures such as bulkheads and groins. The greatest natural change at the inlet entrance from 1936 to 1947 was a progressive lowering of the beach.

The ocean shoreline beginning 300 meters northeast of Garden Pier and extending 1.2 kilometers southwest to Central Pier receded between 1936 and 1947 with a greatly accelerating rate after 1939 (Fig. 48). After the placement of a beach fill in 1948, from July 1948 to August 1960, the shoreline between the Oriental Avenue jetty and New Hampshire Avenue experienced progression ranging from a maximum of about 52 meters at the jetty to about 6 meters at New Hampshire Avenue. During this same period the shoreline between New Hampshire Avenue and Steel Pier receded, with few exceptions, from a maximum of about 40 meters between Vermont and Rhode Island Avenues to a maximum of 3 meters in the region east of Steel Pier. The recession between Vermont and Rhode Island Avenues duplicated the shoreline position of 1936 (Fig. 48).

Surveys in July and October 1948, February and May 1949, January 1950, December 1958, August 1959 and 1960, and March 1962 provide detailed profile data for the area between the Oriental Avenue jetty and Steel Pier (U.S. Congress, 1964b). There are no indications, from the previous data, of any definite quantitative trends in volumetric changes along this reach extending from the Boardwalk to approximately 1.8 meters below MLW. Likewise, for the 11-year BEP study, there appears to be no clearly defined trend in volumetric changes throughout the seven selected profiles. The two most significant events are the 1963 and 1970 beach fills and the natural transport of that material downdrift, as shown in Figure 33.

Figure 49 depicts four sets of profiles of the beach and offshore regions from January 1936 to February 1948 (before the 1948 beach fill). These profiles indicate that relative stability increases with distance southwest from the Oriental Avenue jetty and Absecon Inlet.

Profile envelopes for each profile line throughout the study period (App. F) depict the entire range of maximum and minimum elevations surveyed at given distances along the profile line and do not appear to indicate any clear trend to greater stability from profile line 1 to profile line 7.

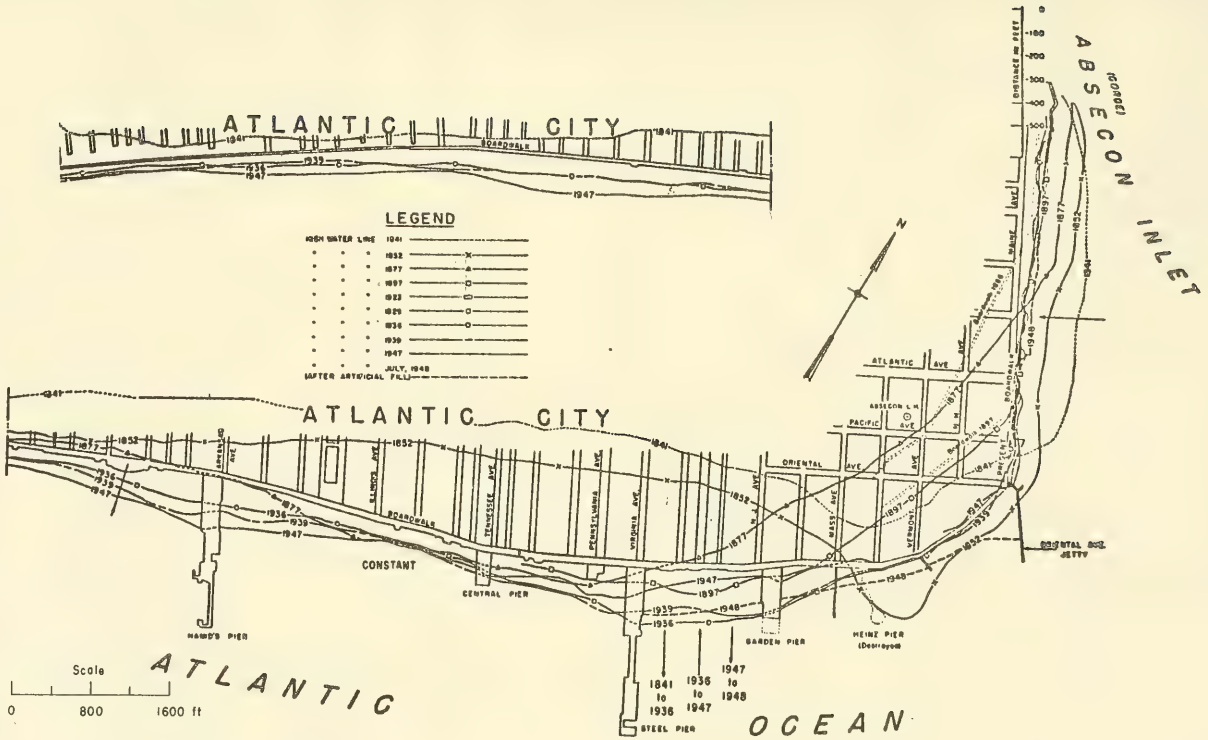

Figure 48. Shoreline changes at Atlantic City, 1841-1948 (Beach Erosion Board, 1950).

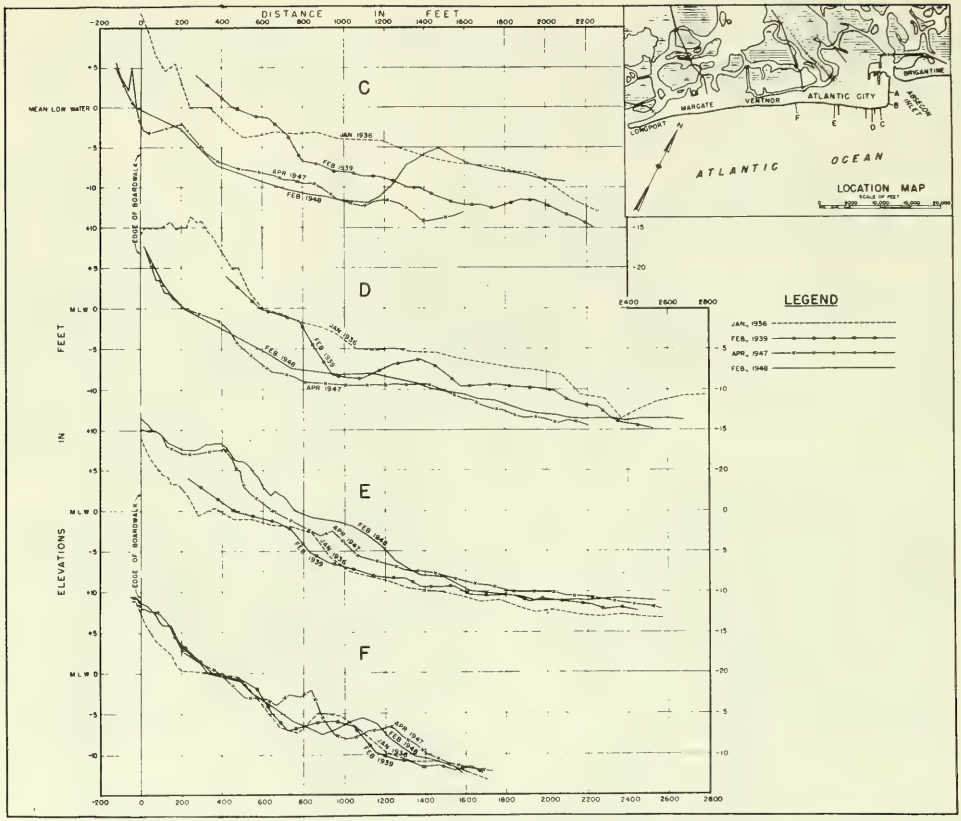

Figure 49. Profile changes along Atlantic City, 1936-48 (Beach Erosion Board, 1950).

2. Seasonal Changes and Wave Climate.

Figure 50 combines mean monthly wave height and period information obtained from Atlantic City and the Toms River Coast Guard Station (Fig. 1) for comparison. Of these sources, the gage data are considered more reliable although the visual observations provide important nearshore wave direction information. The gage data (Thompson and Harris, 1972) were obtained from 7-minute pen-and-ink records taken six times daily from a 7.62-meter relay-type gage located on the seaward end of Steel Pier. The visual observations (made by local volunteers) include estimations of nearshore wave period, height, direction, and breaker type. The Cooperative Surf Observation Program (COSOP) data were also obtained visually by cooperating personnel from U.S. Coast Guard Stations at Atlantic City and Toms River. As shown in Figure 50, there is considerable variation between these sources of wave data.

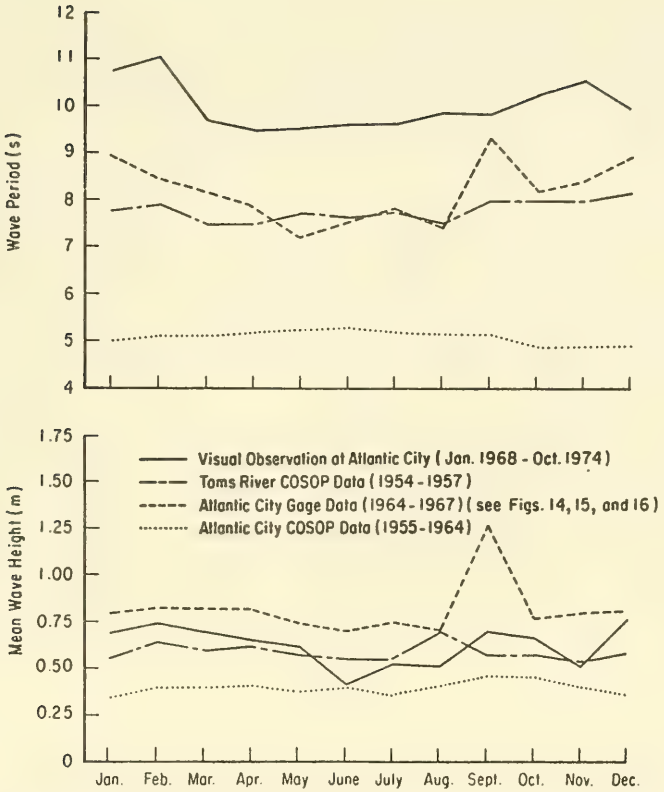

Figure 50. Mean monthly gage and visual data for wave heights and periods for Atlantic City.

The visual observation data indicate that the breaker approach is predominantly from within a sector of 5° to the left of shore-normal to an observer on the beach.

3. Coastal Engineering Implications.

The data in this study largely indicate the far-reaching influence of the two beach fills of 1963 and 1970. Judging from the volumetric and MSL shoreline changes through time, shown in Figures 33 and 44, respectively, the beach fills accomplished their purpose of rebuilding the beach, not only where the fill was directly placed, but also downdrift, as the result of natural littoral processes. The severe erosional condition at profile line 2, however, bears closer examination to determine the specific causes as well as possible solutions to this critical problem.

Among the greatest difficulties in determining how and where the sand is transported are the incomplete surveying of the entire Absecon Island and the

relatively shallow surveying out to only 2 feet below MSL. Therefore, the amount of sand transported offshore or alongshore to the southwest cannot be determined. To better understand the complex and dynamic sediment movement in this area, and thereby arrive at a functional solution, the entire island should be studied as a complete system from Absecon Inlet to Great Egg Harbor Inlet. This would enable a more reliable description of the processes involved along this coastline. More information should also be obtained relating to the processes of the inlets at both ends of the island to enhance the understanding of the impact these inlets have on Absecon Island.

Prestorm and poststorm surveys played an important role in understanding some of the storm-related processses taking place along this coast. Additional surveys of this type would significantly increase the awareness of just how much sand is moved and where during storms, which would then enable the area to plan accordingly before the storm season. Again, this points out the need to survey farther offshore to locate where some of the sand is being transported.

The implications of the beach-fill project in March 1979 indicate the need for careful planning of the time, location, and grain size of the fill material when undertaking such a project. The grain size of the fill material taken from under the Boardwalk for this project was much smaller than the median grain size of the beach material in the vicinity of the nourishment project. This factor, in conjunction with the time of year (March being a highly susceptible time for storm waves), resulted in most of the fill being washed away almost immediately on placement, according to a bulldozer operator on the site. This beach-fill project, then, appeared to be much less successful than the two fills conducted in 1963 and 1970.

VI. SUMMARY

Each of the seven profile lines at Atlantic City, spaced from a minimum of 467 meters to a maximum of 1.62 kilometers apart, was surveyed a minimum of 118 times, generally from the seaward edge of the Boardwalk to wading depth. Frequency of surveys ranged from weekly to quarterly (Figs. 20 and 21). During the study there were 17 reasonably well-documented storms with prestorm and poststorm surveys (Table 5).

The study area extends 5 kilometers southwest from the Absecon Inlet jetty and is comprised of 0.27-millimeter median grain-size quartz sand. The foreshore slope ranges from 0.039 to 0.066 with an average of 0.047 over the seven profile lines. The berm width, measured from the Boardwalk, extends between 5 meters at profile line 2 and 180 meters at profile line 1 with an overall average of 80 meters. The average berm elevation above MSL is 2.2 meters with a range beween 1.3 and 3.0 meters.

Winds are generally out of the southwest quadrant with mean speeds ranging from 20 to 45 kilometers per hour (Figs. 9, 10, and 11). The mean significant wave height is 0.81 meter with a mean wave period of 8.18 seconds consisting predominantly of plunging waves. The area also has a mean tidal range of 1.2 meters.

Among the largest natural changes measured between surveys at a single profile line were a volume loss of 51.39 cubic meters per meter during the

storm of 2 March 1969 at profile line 5 and a shoreline recession of 30.18 meters during the 25 February 1968 storm at profile line 7. Storm changes (Fig. 30) indicate no clear correlation between shoreline recession and erosion, as might be expected. For example, during the 2 March 1969 storm, the average shoreline accreted 6.99 meters, whereas the average above MSL unit volume eroded 11.01 cubic meters per meter. However, profile line 2 shows the most critical erosion, as shown in Figures 36, 37, and 38.

Major beach-fill projects were completed in 1963 and 1970, introducing approximately 428,000 and 635,000 cubic meters of fill material, respectively, to the northern end of the study area (see Fig. 31). These fills were reasonably successful in nourishing the beach, as shown in Figure 33.

Seasonal changes are indicated with a maximum volume of sand above MSL from May through October (Fig. 45). The net volume change above MSL along the beach, disregarding the 1970 beach fill, is near zero. Although the beach, as a whole, experienced a near zero net change during the period 1963-69, there was a shift of beach storage volume from the 1963 fill site on the northern end of the study area toward the southwest, along the beach (Fig. 33). This shift of beach volume was expected with time and resulted in an effective beach-fill project.

In conclusion, this study was extremely valuable for the quantitative determination of some of the shore processes taking place at Atlantic City as well as to indicate how such studies may be accomplished more effectively and efficiently in the future.

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APPENDIX A

PROFILE LINE DOCUMENTATION

The station description forms in this appendix provide a summary of all data needed to recover or reestablish a survey point.

The horizontal and vertical control was first established when Atlantic City was surveyed for the Storm Warning Program, the forerunner of the Beach Evaluation Program. Most of the bronze disks were placed on the profile lines in 1975; a few were placed in 1976. All survey work was done by the U.S. Army Engineer District, Philadelphia. The given elevations are referenced to sea level datum.

The data on these forms are subject to change due to the reestablishment of survey points, or the updating of culture shown. CERC should be contacted for any updating of these data.

COUNTRY	TYPE OF MARK	STATION	
U.S.A.	Standard Bronze Disk	BE-A Sta. 0+00	Profile line 1
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION (FT)**
Atlantic City, NJ	BE-A 0+00	Corps of Engrs.	7.20
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
39°21'57.72"	74°24'36.57"		S.L.D. 1929
(NORTHING) (EASTING) (FT)	(EASTING) (NORTHING) (FT)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
194 120	2 072 524	NJ Trans Merc.	Corps of Engineers
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	**GRID AND ZONE**	**DATE** 19 Nov 75 / **ORDER**

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

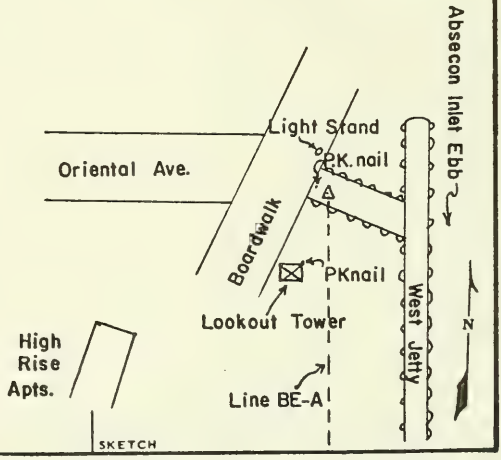
TO OBTAIN GRID AZ. (ADD) (SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

The station is located in Atlantic City, NJ at the east end of Oriental Avenue, and the north end of the west jetty of Absecon Inlet; 52.04 feet north of PK (elevation 7.58') nail in the lower end of diagonal brace under the NE corner of Coast Guard Lookout Tower; 11.69 feet east of NE corner of light stand on east side of boardwalk; 10.0 feet east of east side of boardwalk; 9.97 feet east of a PK nail in vertical side of the east stringer of boardwalk on centerline of Oriental Avenue extended; 3.0 feet north of centerline of stone groin, and 1.0 feet south of centerline Oriental Avenue extended.

The station is marked by a standard disk grouted into the top of stone groin.

NJ Grid Azimuth of Line BE-A 321°-30'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is U.S.Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-B Sta. 0+10	Profile line 2
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
Atlantic City, NJ	BE-B 0+10	Corps of Engrs.	8.03 XXX
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
39°21'44.56"	74°24'46.26"		S.L.D. 1929
(NORTHING)~~(EASTING)~~(NORTHING) (FT) (M)	(EASTING)~~(NORTHING)~~(EASTING) (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
192 786 XXX	2 071 767 XXX	NJ Trans Merc.	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	**GRID AND ZONE**	**DATE** 19 Nov 75 **ORDER**

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

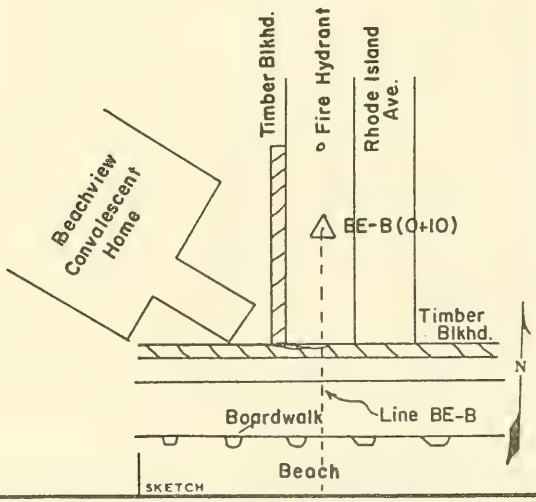
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

The station is located in Atlantic City, NJ on the west sidewalk of Rhode Island Avenue; 130.40 feet north of a square cut in the top of concrete reinforcement on south side of boardwalk of Rhode Island Avenue (elevation 12.43'); 53.86 feet east of inner corner of Beachview convelescent home building; 48.5 feet north of a timber bulkhead at the ocean end of avenue; 39.97 feet NE of outer corner of Beachview convelescent home building; 10.00 feet south of top of fire hydrant and 1.5 feet west of the west curb of Rhode Island Avenue.

Station is marked by a standard disk grouted flush with sidewalk.

NJ Grid Azimuth of Line BE-B 332°-18'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is U.S.Continental Army Command.

COUNTRY: U. S. A.	TYPE OF MARK: Standard Bronze Disk	STATION: BE-C Sta. (-)2+00 20' west — Profile line 3	
LOCALITY: Atlantic City, NJ	STAMPING ON MARK: BE-C -2+00 20'W	AGENCY (CAST IN MARKS): Corps of Engineers	ELEVATION (FT): 7.85
LATITUDE: 39°21'36.91"	LONGITUDE: 74°25'04.15"	DATUM:	DATUM: S.L.D. 1929
(NORTHING) (EASTING) (FT): 192 008	(EASTING) (NORTHING) (FT): 2 070 364	GRID AND ZONE: NJ Trans Merc.	ESTABLISHED BY (AGENCY): Corps of Engineers
(NORTHING) (EASTING) (FT) (M):	(EASTING) (NORTHING) (FT) (M):	GRID AND ZONE:	DATE: 19 Nov 75 / ORDER:

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

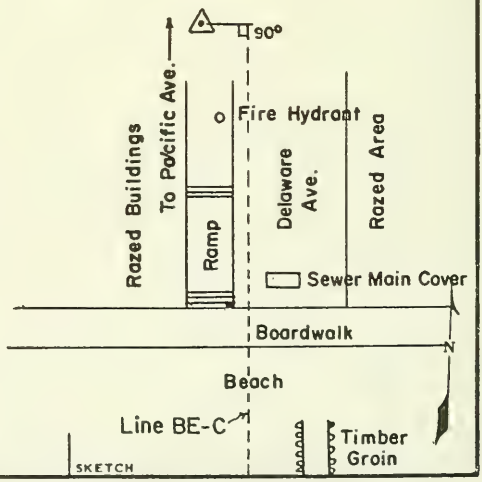
TO OBTAIN GRID AZ. (ADD) (SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

The station is located in Atlantic City, NJ on the west side of Delaware Avenue in an area due for redevelopment; 45.23 feet north of south west corner of sewer main cover; 32.25 feet north of a fire hydrant; 4.92 feet west of a PK nail in the seam of west curb of Delaware Avenue.

Station is marked by a standard disk grouted flush into sidewalk, and is 20' west of profile line.

NJ Grid Azimuth of Line BE-C 333°-26'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is U.S.Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE - D Sta. 0+00	Profile line 4
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION (FT)**
Atlantic City, NJ	BE-D 0+00	Corps of Engrs.	10.71
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
39°21'27.78"	74°25'20.50"		S.L.D. 1929
(NORTHING) (EASTING) (FT)	**(EASTING) (NORTHING) (FT)**	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
191 081	2 069 082	NJ Trans merc.	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING) (FT) (M)**	**GRID AND ZONE**	**DATE** 19 Nov 75 / **ORDER**

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

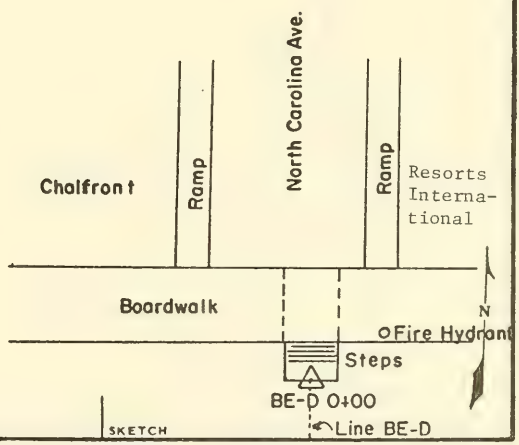
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

Station is located in Atlantic City, NJ at the beach (south) end of North Carolina Avenue, under the boardwalk; 87.88 feet south east of the SE corner of Chalfont Building, 72.29 feet south west of SW corner of Resorts International; 29.52 feet southwest of the top center bolt of fire hydrant.

Station is marked by a standard disk grouted flush into the top step of a pedestrian ramp.

NJ Grid Azimuth of Line BE-D 332°-01'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1959, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is U.S. Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-E (-)2+75 20' west Profile line 5	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT)
Atlantic City, NJ	BE-E -2+75 20'W	Corps of Engrs.	6.56
LATITUDE	LONGITUDE	DATUM	DATUM
39°21'22.90"	74°25'52.27"		S.L.D. 1929
(NORTHING) (FT) (M)	(EASTING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
190 580	2 066 588	NJ Trans Merc	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			24 Aug 76

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

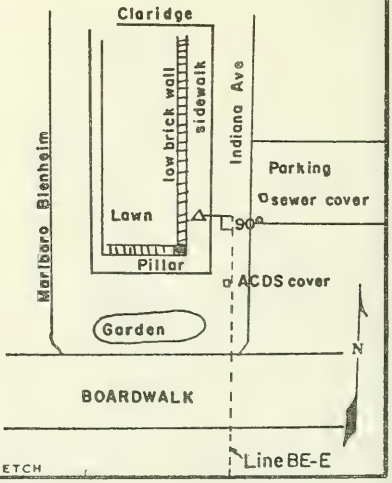
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

Station is located in Atlantic City, NJ on the west side of Indiana Avenue, south of the Claridge Hotel, 49.60 feet west of the SE corner of sewer cover on the east side of Indiana Avenue; 18.79 feet north west of the NW corner of A.C.D.S. cover, just west of the centerline of street, and 12.85 feet north east of top center of pillar on NE side of steps leading to lawn.

Station is marked by a standard disk grouted flush into sidewalk, and is 20' west of profile line.

NJ Grid Azimuth of Line BE-E 332°-36'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is U.S. Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-F Sta. (-) 0+75 Profile line 6	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M)
Atlantic City, NJ	BE-F -0+75	Corps of Engrs.	5.20
LATITUDE	LONGITUDE	DATUM	DATUM
39°21'08.93"	74°26'34.43"		S.L.D. 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
189 159	2 063 280	NJ Trans Merc.	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: 19 Nov 75 / ORDER

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

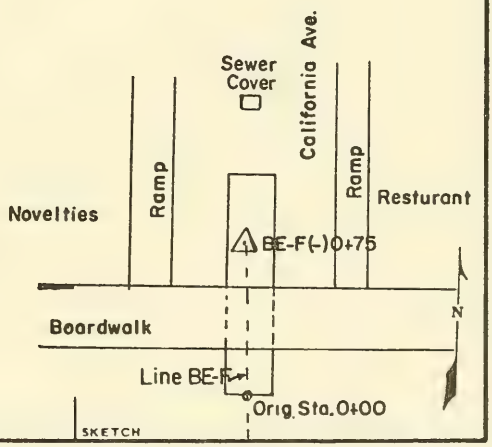
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

Station is located in Atlantic City, NJ under the boardwalk at the ocean, or south end of California Avenue, 49.38 feet south of the SE corner of sewer cover, just west of centerline of California Avenue, 12.0 feet SW of NE corner of east wall for ramp, 8.08 SE of the NW corner of west wall and 1.3 feet east of W. wall.

Station is marked by a standard disk grouted flush with surface of a pedestrain ramp.

NJ Grid Azimuth of Line BE-F 332°-55'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM S-237; the proponent agency is U.S.Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-G Sta. (-) 0+75 25.5' East	Profile line 7
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT)
Atlantic City, NJ	BE-G -0+75 25.5' E	Corps of Engrs.	11.64
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
39°20'45.28"	74°27'34.82"		S.L.D. 1929
(NORTHING)(EASTING) (FT)	(EASTING)(NORTHING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
186 754	2 058 542	NJ Trans Merc	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: 27 Aug 76 / ORDER

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

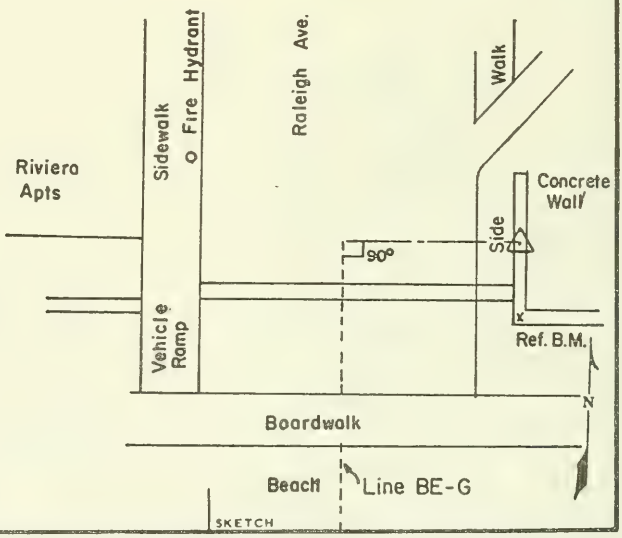
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

The station is located in Atlantic City, NJ on the east side of south (ocean) end of Raleigh Avenue; 52.59' south of north end of concrete wall; 44.31 feet southeast of fire hydrant; 38.20 feet north of reference B.M. which is a square cut in the southwest corner of concrete wall (elevation 11.52); and 11.0 feet east of east curb of Raleigh Avenue.

Station is marked by a standard disk grouted flush in concrete wall on east side of Raleigh Avenue, and is 25.5' east of profile line.

NJ Grid Azimuth of Line BE-G 328°-14'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is U.S.Continental Army Command.

APPENDIX B

PROFILE LINE SURVEY DATA

The survey data for the Atlantic City beach study are tabulated by profile line number and survey date (in the form YRMODA). Distances are in feet from the profile line bench mark; elevations are in feet above MSL.

DATE	621024
BRVY	1
TIME	1200
----	------
66.	4.4
121.	4.0
221.	3.9
321.	3.7
420.	3.7
508.	3.7
542.	6.6
640.	1.0
722.	-2.9

DATE	621101
BRVY	2
TIME	1200
----	------
20.	5.0
48.	4.9
79.	3.8
120.	3.9
170.	3.9
221.	3.9
271.	3.9
321.	3.6
370.	3.8
421.	3.8
520.	5.4
559.	6.3
610.	1.8
648.	-1.1
697.	-1.4
723.	-2.1

DATE	621109
BRVY	3
TIME	1200
----	------
29.	4.2
120.	4.0
224.	3.9
273.	3.8
321.	3.7
420.	3.7
521.	3.6
570.	8.9
614.	1.2
683.	.5
736.	-.6

DATE	621212
BRVY	4
TIME	1200
----	------
40.	4.0
105.	3.8
179.	4.0
261.	4.2
342.	4.4
418.	4.6
497.	4.3
574.	.8
673.	-2.0
788.	-3.5

DATE	630109
BRVY	5
TIME	1200
----	------
0.	7.1
15.	7.0
17.	4.5
80.	4.3
100.	3.8
150.	3.8
200.	3.8
250.	3.6
300.	4.4
350.	4.5
401.	4.8
450.	4.8
500.	5.4
526.	5.8
551.	3.1
582.	1.7
600.	1.2
625.	.5
650.	.1
670.	-1.3

DATE	630116
BRVY	6
TIME	1200
----	------
17.	4.5
50.	3.9
100.	3.4
125.	3.3
151.	3.4
200.	3.5
250.	3.7
300.	3.8
350.	3.9
401.	4.1
425.	4.2
436.	3.9
500.	5.3
519.	5.5
551.	2.8
601.	1.2
652.	-.3
674.	-1.0
701.	-1.4

DATE	630122
BRVY	7
TIME	1200
----	------
275.	4.2
300.	4.4
350.	4.6
400.	4.8
451.	4.5
500.	5.4
531.	5.6
551.	4.0
601.	1.5
674.	-1.2

DATE	630130
BRVY	8
TIME	1200
----	------
0.	7.1
16.	7.1
18.	4.5
50.	3.9
101.	3.5
151.	3.5
200.	3.8
250.	3.7
300.	3.8
350.	3.9
400.	4.0
451.	4.4
500.	5.3
514.	5.3
531.	4.8
551.	3.2
601.	1.0
651.	-.5
676.	-.9
701.	-1.1

DATE	630205
BRVY	9
TIME	1200
----	------
17.	4.8
50.	3.8
100.	3.4
150.	3.5
201.	3.8
251.	3.7
301.	3.7
351.	4.2
400.	4.2
451.	4.4
500.	5.3
526.	5.3
551.	4.1
575.	2.6
601.	1.1
651.	0.0
676.	-1.0

DATE	630213
BRVY	10
TIME	1200
----	------
50.	3.8
100.	3.3
151.	3.2
200.	3.3
250.	3.3
301.	3.7
350.	3.9
401.	3.9
451.	4.3
501.	5.1
525.	5.3
551.	4.5
601.	.9
651.	-.5
677.	-1.2

DATE	630221
BRVY	11
TIME	1200
----	------
-1.	7.1
15.	7.1
16.	6.1
50.	6.6
99.	7.9
150.	8.7
199.	9.0
250.	8.3
273.	7.8
300.	6.9
350.	6.4
400.	5.8
425.	5.3
450.	5.0
474.	4.9
500.	5.3
526.	5.0
600.	1.9
641.	.7
700.	-.7
785.	-1.4

DATE	630227
BRVY	12
TIME	1200
----	------
50.	6.6
99.	7.7
125.	8.0
150.	8.8
200.	8.7
225.	8.7
275.	7.6
300.	7.1
351.	6.4
400.	5.7
450.	5.0
500.	5.1
525.	5.0
550.	4.0
576.	3.4
600.	1.6
650.	1.1
676.	.5
700.	0.0
786.	-1.0

DATE	630309
BRVY	13
TIME	1200
----	------
326.	6.7
375.	5.9
401.	5.8
424.	5.3
450.	5.0
525.	5.0
550.	4.4
575.	3.3
600.	2.5
627.	1.7
650.	1.2
701.	0.0
726.	-.9
751.	-1.1

DATE	630313
BRVY	14
TIME	1200
----	------
0.	7.1
16.	7.0
16.	6.1
24.	6.5
45.	6.5
99.	7.7
150.	8.8
175.	8.8
200.	9.0
225.	8.8
250.	8.4
275.	7.7
300.	7.0
325.	6.8
351.	6.3
400.	5.8
424.	5.2
451.	4.9
474.	4.9
500.	5.0
526.	5.0
550.	4.7
575.	3.8
600.	2.7
624.	1.9
651.	1.2
700.	0.0
789.	-1.3

DATE	630321
BRVY	15
TIME	1200
----	------
16.	6.0
49.	6.5
99.	7.5
150.	8.5
175.	8.4
200.	9.0
225.	8.4
250.	8.3
300.	6.9
324.	6.7
350.	6.3
400.	5.8
425.	5.2
450.	4.9
500.	5.0
550.	4.8
574.	4.2
600.	3.0
651.	1.2
701.	0.0
725.	-.8
751.	-2.0

DATE	630402
BRVY	16
TIME	1200
----	------
150.	8.8
200.	9.1
225.	8.6
250.	8.8
275.	6.9
300.	7.4
325.	6.9
350.	6.8
400.	5.8
425.	5.7
450.	5.0
475.	5.2
525.	5.2
551.	4.4
576.	3.2
601.	2.2
651.	.5
675.	0.0
786.	-1.4

DATE 630523 BRVY 17 TIME 1200		DATE 630611 BRVY 18 TIME 1200		DATE 630626 BRVY 19 TIME 1200		DATE 630712 BRVY 20 TIME 1200		DATE 630724 BRVY 21 TIME 1200		DATE 630807 BRVY 22 TIME 1200		DATE 630823 BRVY 23 TIME 1200		DATE 630905 BRVY 24 TIME 1200	
10.	6.4	0.	7.1	200.	9.2	-1.	7.1	50.	6.6	0.	7.1	0.	7.1	350.	6.7
20.	6.6	10.	7.1	250.	8.1	10.	7.0	100.	7.8	10.	7.1	50.	6.3	400.	6.2
70.	7.0	14.	6.9	300.	7.0	15.	6.5	150.	9.1	15.	6.6	99.	7.8	451.	5.3
140.	9.3	50.	7.1	350.	6.5	49.	6.6	200.	9.2	50.	6.5	150.	9.1	500.	5.4
200.	9.3	100.	7.9	400.	5.8	100.	8.1	224.	8.9	99.	9.1	200.	8.9	551.	5.4
250.	8.6	150.	9.1	451.	5.1	150.	9.0	250.	8.6	150.	8.8	250.	8.5	601.	5.3
300.	7.3	200.	9.2	500.	5.4	200.	9.0	300.	7.3	200.	9.0	300.	7.3	651.	5.0
351.	6.9	250.	8.8	526.	5.1	250.	8.5	351.	6.5	251.	8.8	350.	6.7	701.	2.9
400.	6.3	300.	7.4	550.	5.2	300.	7.3	400.	6.3	300.	7.8	402.	6.1	788.	1.9
450.	5.9	350.	6.9	600.	4.7	351.	6.7	450.	5.9	351.	6.7	451.	5.2		
500.	5.3	400.	6.2	651.	2.6	400.	5.9	500.	5.2	400.	6.0	502.	5.2		
550.	5.3	450.	5.5	699.	1.8	450.	5.3	551.	5.1	451.	5.8	551.	5.2		
601.	4.6	500.	5.4	702.	.9	500.	5.3	601.	5.2	501.	5.2	574.	5.1		
620.	4.1	551.	5.4	751.	0.0	551.	5.3	625.	5.4	551.	5.3	602.	5.3		
651.	3.3	575.	5.2	801.	-1.1	601.	4.9	701.	2.2	601.	5.2	627.	4.4		
700.	1.3	601.	4.7			625.	4.3	724.	1.8	626.	5.1	652.	4.8		
752.	.2	651.	2.9			651.	2.9	751.	.9	679.	2.9	676.	3.8		
801.	-1.0	701.	1.4			676.	1.9	777.	.7	702.	1.8	700.	1.5		
820.	-2.8	725.	.8			701.	1.2	851.	-.7	732.	.4	727.	.9		
		751.	.8			751.	-.2			801.	-.2	752.	.8		
		777.	0.0			776.	-.7			852.	-1.4	776.	-.2		
		826.	-1.0									801.	-.7		

DATE 630925 BRVY 25 TIME 1200		DATE 631009 BRVY 26 TIME 1200		DATE 631028 BRVY 27 TIME 1200		DATE 631114 BRVY 28 TIME 1200		DATE 631231 BRVY 29 TIME 1200		DATE 640117 BRVY 30 TIME 1200		DATE 640214 BRVY 31 TIME 1200		DATE 640312 BRVY 32 TIME 1200	
0.	7.2	-60.	10.5	201.	9.0	-61.	10.5	15.	6.2	0.	7.0	0.	7.0	0.	7.0
14.	7.1	-25.	7.5	251.	8.2	-25.	7.5	50.	6.5	10.	7.0	21.	6.9	22.	5.4
15.	6.4	-1.	7.8	301.	6.7	0.	6.9	76.	6.8	15.	5.7	51.	5.6	50.	5.6
25.	5.8	14.	7.0	352.	5.8	15.	6.9	101.	6.7	21.	5.0	101.	5.8	100.	5.0
50.	7.6	15.	8.1	403.	5.2	15.	6.0	127.	6.0	50.	5.6	152.	7.2	150.	4.4
101.	8.8	25.	8.8	454.	4.8	25.	4.5	151.	5.9	101.	5.8	202.	4.5	201.	4.0
152.	9.3	50.	8.4	504.	4.5	51.	4.8	202.	4.9	201.	4.5	252.	4.1	251.	3.7
202.	8.8	100.	8.0	528.	4.5	101.	5.1	227.	4.5	252.	3.8	302.	3.8	301.	3.6
252.	6.9	151.	8.8	554.	4.9	151.	5.1	252.	4.5	303.	3.5	352.	3.5	352.	3.6
302.	5.7	201.	9.0	604.	5.3	202.	4.0	2A1.	4.4	353.	3.2	403.	3.5	402.	3.3
352.	5.0	252.	9.4	655.	2.4	252.	3.6	302.	4.1	403.	3.0	453.	3.4	453.	3.1
454.	4.4	303.	9.8	706.	.8	302.	3.3	352.	4.1	453.	2.9	504.	3.2	503.	3.0
504.	4.0	353.	9.8	746.	0.0	353.	3.4	378.	4.0	504.	2.8	554.	3.0	553.	3.1
554.	3.8	401.	8.8	779.	-.2	403.	2.8	403.	4.2	555.	2.5	604.	2.3	604.	2.2
580.	3.8	454.	8.3	806.	-.8	453.	2.6	453.	4.2	606.	2.1	655.	1.8	654.	1.1
606.	3.4	504.	3.9			504.	1.9	503.	4.2	655.	1.6	706.	0.0	704.	-.1
631.	3.0	530.	3.9			554.	1.2	554.	4.0	705.	1.2	756.	-2.0	785.	-2.6
681.	1.0	555.	3.9			655.	-1.3	580.	3.9	756.	.6	781.	-2.8		
707.	.6	605.	4.5					630.	2.7	831.	-1.4				
731.	0.0	630.	2.3					655.	1.9						
		656.	1.2					706.	1.0						
		706.	0.0					731.	.9						
		731.	-.4					756.	.1						
		748.	-1.0					806.	-1.6						
								831.	-2.1						

DATE 640609 BRVY 33 TIME 1200	DATE 640827 BRVY 34 TIME 1200	DATE 640824 BRVY 35 TIME 1200	DATE 640831 BRVY 36 TIME 1200	DATE 640925 BRVY 37 TIME 1200	DATE 641203 BRVY 38 TIME 1200	DATE 650120 BRVY 39 TIME 1200	DATE 650220 BRVY 40 TIME 1200
25. 5.1	25. 4.7	0. 6.8	0. 6.8	25. 5.1	6. 4.9	25. 4.1	20. 4.9
50. 5.1	50. 4.9	24. 5.1	24. 5.1	49. 5.2	50. 5.2	51. 4.2	51. 4.1
100. 4.5	100. 4.5	50. 5.2	50. 4.9	100. 4.5	100. 4.6	101. 3.8	101. 3.6
140. 3.4	151. 3.6	100. 4.6	101. 4.2	150. 4.1	151. 4.0	151. 3.4	151. 3.5
201. 3.0	201. 3.2	151. 4.0	151. 3.7	201. 3.3	201. 3.1	202. 3.1	201. 3.1
251. 3.1	251. 3.2	201. 3.4	201. 3.3	251. 3.5	251. 3.5	252. 2.8	252. 2.8
302. 3.1	308. 2.9	251. 3.1	251. 2.9	301. 2.5	301. 3.0	302. 2.8	302. 2.8
351. 2.9	351. 2.9	302. 3.0	301. 2.9	351. 3.0	352. 3.0	353. 2.8	353. 2.8
402. 2.6	402. 2.8	352. 3.0	351. 2.9	402. 3.3	402. 3.1	403. 2.8	403. 2.8
452. 2.7	452. 2.8	402. 3.0	402. 2.9	452. 3.4	452. 3.1	453. 2.8	453. 3.0
503. 2.8	503. 2.8	452. 2.9	452. 2.7	503. 3.0	502. 2.6	504. 2.6	504. 3.0
553. 2.8	553. 3.0	503. 2.7	502. 2.6	553. 3.0	552. 2.7	554. 2.1	554. 3.0
604. 2.1	604. 3.0	553. 3.1	552. 2.1	603. 3.0	603. 1.9	604. 1.9	604. 3.0
654. 1.8	654. 3.1	603. 3.3	602. 3.5	653. 1.8	653. 1.9	655. 1.7	654. 3.0
705. .3	704. .1	654. 3.2	653. 4.7	704. .9	703. .1	705. 1.7	755. .2.1
755. .2.7	755. .2.3	693. .7	704. 1.8		754. .2.0	755. 1.3	806. .3.0
805. .3.3	780. .3.0	705. .7	753. .2		770. .2.3	806. .3	
		744. .1.2	804. .1.1			856. .1.6	
		805. .2.4	830. .1.1			881. .2.2	
			855. .1.9				

DATE 650908 BRVY 41 TIME 1200	DATE 651020 BRVY 42 TIME 1200	DATE 651220 BRVY 43 TIME 1200	DATE 660124 BRVY 44 TIME 1200	DATE 660320 BRVY 45 TIME 1200	DATE 660426 BRVY 46 TIME 1200	DATE 661103 BRVY 47 TIME 1200	DATE 670118 BRVY 48 TIME 1200
25. 4.9	0. 6.9	25. 5.8	25. 4.8	25. 4.5	25. 5.0	20. 5.2	25. 5.0
50. 4.5	50. 4.7	51. 6.0	50. 5.1	50. 3.5	50. 5.1	50. 4.8	50. 4.5
100. 3.9	101. 3.2	100. 5.3	100. 4.5	101. 3.1	100. 4.3	101. 3.9	100. 3.6
151. 3.5	151. 2.9	151. 4.7	151. 4.0	151. 2.9	150. 3.8	151. 3.6	151. 3.3
201. 3.2	201. 2.8	201. 4.7	201. 3.4	201. 2.9	201. 3.4	202. 3.7	201. 3.3
252. 2.8	252. 2.9	252. 4.0	252. 3.1	251. 2.9	252. 3.5	252. 3.4	252. 3.1
302. 2.7	302. 2.9	302. 4.0	302. 3.2	302. 3.2	302. 3.4	302. 3.5	302. 3.0
353. 2.4	352. 3.1	353. 3.9	352. 3.4	352. 3.4	352. 3.7	352. 3.5	352. 2.6
403. 2.4	403. 3.4	403. 3.2	402. 3.5	402. 3.6	402. 3.7	402. 3.5	402. 2.7
453. 2.7	453. 3.6	453. 3.4	452. 3.5	452. 4.2	451. 4.0	453. 3.2	453. 2.4
503. 2.9	503. 3.9	503. 3.7	503. 3.3	503. 4.1	503. 5.1	503. 3.1	503. 2.5
553. 3.3	554. 4.1	554. 3.7	553. 3.3	553. 3.6	553. 4.8	603. 4.0	553. 3.5
604. 3.8	604. 3.9	604. 4.4	603. 3.0	603. 3.5	604. 4.8	653. 3.3	617. 3.0
654. 4.8	654. 3.9	654. 4.2	654. 2.4	653. 2.0	654. 2.0	704. .3	654. 2.2
705. 1.9	704. 2.8	704. 3.8	704. .5	703. .8	704. .5	804. .1.8	704. .9
755. .1	755. .2	755. .9	804. .1.0	754. .3.3	754. .1.2	755. .1.0	
806. .2.0	806. .1.6	806. .4.5	880. .1.9	855. .3.7	804. .1.2	805. .2.1	
856. .2.8		856. .5.2				856. .2.5	

DATE	670503
SRVY	49
TIME	1200,
----	------
23.	4.0
50.	4.0
101.	3.3
151.	3.0
201.	3.0
252.	2.9
302.	2.6
353.	2.5
402.	2.0
453.	1.8
503.	1.9
553.	1.9
603.	2.4
654.	2.3
704.	1.2
755.	-.4
804.	-2.2
854.	-2.4

DATE	670915
SRVY	50
TIME	1200
----	------
23.	4.2
50.	3.9
100.	3.2
150.	2.8
200.	2.8
250.	2.7
300.	2.7
350.	2.4
400.	2.3
450.	2.2
500.	1.9
550.	1.9
600.	2.8
650.	3.8
701.	3.4
750.	1.9
801.	.1
850.	-1.0
900.	-1.8

DATE	670919
SRVY	51
TIME	1200
----	------
26.	4.0
50.	3.8
100.	2.8
151.	2.5
200.	2.4
250.	2.3
300.	2.3
350.	2.3
400.	2.0
450.	1.9
500.	1.9
550.	1.9
600.	1.4
651.	1.1
700.	1.5
751.	1.4
800.	.5
850.	-1.5
900.	-2.1

DATE	671213
SRVY	52
TIME	1200
----	------
24.	4.1
49.	3.8
100.	2.7
150.	2.7
200.	2.6
250.	2.6
300.	2.6
350.	2.5
400.	2.4
450.	2.6
500.	3.7
550.	4.1
600.	3.5
651.	2.1
700.	1.2
751.	.2
800.	-1.7
850.	-3.8

DATE	680115
SRVY	53
TIME	1200
----	------
24.	4.4
50.	4.1
100.	2.8
150.	2.7
200.	2.4
250.	2.4
300.	2.7
350.	3.3
400.	4.2
450.	4.3
500.	4.1
550.	3.8
600.	2.9
650.	2.1
699.	1.0
750.	0.0
799.	-1.7
849.	-2.5

DATE	680124
SRVY	54
TIME	1200
----	------
24.	4.4
50.	4.2
100.	2.8
150.	2.6
200.	2.5
250.	2.4
300.	2.8
350.	3.4
400.	3.9
450.	4.8
500.	4.7
549.	4.1
600.	3.3
649.	1.6
699.	.6
749.	-.9
799.	-2.3

DATE	680130
SRVY	55
TIME	1200
----	------
25.	4.4
50.	3.9
100.	2.6
150.	2.4
200.	2.2
250.	2.3
300.	2.4
350.	3.1
400.	3.5
450.	3.2
500.	3.5
550.	3.3
600.	3.1
650.	2.3
699.	1.1
750.	-.7
800.	-2.5

DATE	680208
SRVY	56
TIME	1200
----	------
0.	7.1
25.	4.0
50.	3.9
100.	2.6
150.	2.8
200.	2.5
250.	2.4
300.	2.8
350.	3.3
400.	3.6
450.	3.4
500.	3.0
550.	2.8
600.	2.2
650.	1.2
700.	.7
750.	0.0

DATE	680215
SRVY	57
TIME	1200
----	------
-1.	7.1
23.	3.8
55.	3.8
100.	2.4
150.	2.4
200.	2.4
250.	2.3
300.	2.3
350.	2.3
400.	3.0
450.	2.8
500.	2.6
550.	2.3
600.	2.3
651.	1.8
700.	1.7
750.	0.0
800.	-2.1
850.	-2.7
900.	-3.8

DATE	680221
SRVY	58
TIME	1200
----	------
-1.	7.1
24.	3.9
50.	3.8
100.	2.5
150.	2.6
199.	2.4
251.	2.4
300.	2.9
350.	2.6
400.	2.8
450.	2.8
500.	2.6
550.	2.6
600.	2.7
650.	2.3
699.	1.7
750.	.2
799.	-1.9
826.	-2.3

DATE	680226
SRVY	59
TIME	1200
----	------
0.	7.1
24.	3.9
50.	3.9
100.	2.6
150.	2.6
200.	2.4
250.	2.3
300.	2.5
351.	2.9
400.	3.0
450.	2.9
500.	2.7
550.	2.7
650.	3.6
700.	1.3
750.	-1.0
800.	-2.4
850.	-2.8
900.	-3.4

DATE	680307
SRVY	60
TIME	1200
----	------
0.	7.1
22.	4.0
50.	3.9
100.	2.5
150.	2.5
200.	2.5
251.	2.4
300.	2.7
350.	2.9
401.	2.9
450.	2.9
500.	3.0
550.	3.2
600.	2.8
650.	2.1
700.	1.0
750.	-.5
800.	-1.6
850.	-2.0

DATE	680313
SRVY	61
TIME	1200
----	------
0.	7.2
24.	3.1
50.	3.9
100.	2.9
150.	2.8
201.	2.5
251.	2.5
300.	2.8
350.	2.9
401.	2.9
450.	3.3
500.	3.9
550.	3.8
600.	3.1
649.	2.1
699.	1.0
750.	.1
800.	-1.3
850.	-2.4

DATE	680322
SRVY	62
TIME	1200
----	------
50.	3.9
100.	2.8
150.	2.7
200.	2.4
251.	2.5
300.	2.9
351.	2.9
401.	2.9
450.	2.9
500.	2.9
550.	2.9
600.	2.7
650.	2.1
699.	1.9
751.	.1
800.	-1.8
850.	-2.2
900.	-3.1

DATE	681007
SRVY	63
TIME	1200
----	------
23.	4.8
50.	3.9
100.	2.6
150.	2.6
200.	2.4
250.	2.5
300.	2.7
350.	2.7
400.	2.7
450.	2.8
500.	2.8
550.	3.0
600.	4.2
650.	5.5
675.	6.0
700.	2.9
750.	.4
800.	-.9
850.	-2.1
875.	-2.6

DATE	681025
SRVY	64
TIME	1200
----	------
5.	4.9
50.	3.8
100.	2.8
150.	2.5
200.	2.3
250.	2.4
300.	2.5
350.	2.7
400.	2.7
450.	3.0
500.	3.0
550.	3.6
600.	5.0
650.	6.5
700.	1.9
750.	.7
800.	-.7
825.	-1.4

DATE 681115		DATE 681220		DATE 690113		DATE 690122		DATE 690129		DATE 690205		DATE 690212		DATE 690219	
BRVY	65	BRVY	66	BRVY	67	BRVY	68	BRVY	69	BRVY	70	BRVY	71	BRVY	72
TIME	1200	TIME	1800	TIME	1800	TIME	1200	TIME	1200	TIME	1200	TIME	1800	TIME	1200
25.	4.1	25.	4.4	0.	7.2	0.	7.2	0.	7.2	0.	7.2	25.	3.9	0.	7.2
50.	4.2	50.	4.6	25.	4.4	25.	3.9	25.	4.3	25.	4.1	50.	3.8	25.	3.7
100.	3.3	100.	3.0	50.	4.0	50.	4.0	50.	4.1	50.	3.8	100.	8.9	50.	3.8
150.	3.1	150.	2.8	100.	3.0	100.	2.9	100.	3.0	100.	2.9	150.	2.7	100.	3.0
200.	3.0	200.	2.7	150.	2.8	150.	2.7	150.	2.7	150.	2.8	200.	2.7	150.	2.7
250.	3.1	250.	2.8	200.	2.9	200.	2.8	200.	2.8	200.	2.9	250.	2.8	200.	2.8
300.	3.2	300.	2.8	250.	2.9	250.	2.7	250.	2.9	250.	2.9	300.	2.9	250.	2.9
350.	3.5	350.	3.1	300.	2.8	300.	2.8	300.	2.9	300.	2.9	350.	3.2	300.	3.0
400.	3.7	400.	3.3	350.	3.2	350.	3.1	350.	3.4	350.	3.5	400.	3.6	350.	3.5
450.	3.8	450.	3.7	400.	3.5	400.	3.4	400.	4.0	400.	4.0	450.	3.9	400.	3.5
500.	3.7	500.	3.6	450.	3.7	450.	4.1	450.	4.5	450.	4.5	500.	4.0	450.	3.7
550.	3.2	550.	3.7	500.	4.1	500.	4.4	500.	4.6	500.	4.8	550.	3.8	500.	3.9
600.	2.6	600.	3.2	550.	4.0	550.	3.9	550.	4.2	550.	4.1	600.	3.7	550.	3.7
650.	1.8	650.	2.6	600.	3.8	600.	2.9	600.	3.0	600.	4.0	637.	3.8	600.	3.3
700.	.8	700.	1.8	650.	2.8	650.	2.0	650.	2.2	650.	2.5	650.	2.8	650.	2.4
750.	.4	750.	0.0	670.	2.5	700.	.7	670.	2.0	700.	.5	700.	.1	675.	1.7
800.	-.1	800.	-1.2	700.	.8	750.	-.8	700.	1.0	750.	-1.8	750.	-2.1	700.	.9
850.	-1.6	850.	-3.0	750.	-1.6	800.	-1.7	750.	-.8	800.	-2.9	800.	-2.0	750.	-.6
900.	-3.8			800.	-3.3			800.	-2.3	850.	-2.0	850.	-3.2	800.	-1.5
								885.	-2.9	900.	-3.4	900.	-3.0	850.	-2.0
														900.	-2.9

DATE 690226		DATE 690305		DATE 690312		DATE 690319		DATE 690527		DATE 690923		DATE 691023		DATE 691120	
BRVY	73	BRVY	74	BRVY	75	BRVY	76	BRVY	77	BRVY	78	BRVY	79	BRVY	80
TIME	1200	TIME	1800	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1800	TIME	1200
0.	7.2	0.	7.2	0.	7.2	0.	7.2	0.	7.2	50.	3.9	0.	7.2	0.	7.2
25.	3.8	25.	3.3	25.	3.3	25.	3.3	50.	3.4	100.	2.5	25.	4.4	25.	4.2
50.	3.6	50.	3.6	50.	3.5	50.	3.3	100.	2.5	150.	2.5	50.	3.9	50.	3.6
100.	2.9	100.	2.8	100.	2.8	100.	2.5	150.	2.5	200.	2.7	100.	2.8	100.	2.7
150.	2.8	150.	2.8	150.	2.8	150.	2.7	200.	2.5	250.	2.5	150.	2.9	150.	2.9
200.	2.9	200.	3.0	200.	3.1	200.	2.9	250.	2.5	300.	2.7	200.	3.1	200.	2.9
250.	3.1	250.	3.1	250.	3.2	250.	2.9	300.	2.4	350.	2.6	250.	3.2	250.	3.0
300.	3.4	300.	3.2	300.	3.2	300.	3.1	350.	2.2	400.	2.6	300.	3.2	300.	3.1
350.	3.6	350.	3.1	350.	3.2	350.	3.1	400.	1.8	450.	2.3	350.	3.2	350.	3.0
400.	3.6	400.	3.0	400.	3.0	400.	2.9	450.	2.4	500.	3.2	400.	2.9	400.	3.0
450.	3.6	450.	2.8	450.	2.8	450.	2.8	500.	3.0	550.	3.6	450.	2.9	450.	3.2
500.	3.6	500.	2.2	500.	2.4	500.	2.8	550.	3.5	600.	5.0	500.	3.2	500.	3.1
550.	3.7	550.	1.9	550.	2.3	550.	2.3	600.	4.2	650.	6.3	550.	4.4	550.	3.5
600.	3.1	600.	1.5	600.	2.4	600.	2.8	650.	5.6	700.	2.5	600.	6.4	600.	3.8
650.	2.0	650.	1.4	650.	2.4	650.	3.3	700.	.9	750.	1.2	623.	4.6	650.	2.8
700.	.9	700.	1.3	700.	8.2	700.	2.1	750.	-1.3	800.	-.4	650.	3.2	700.	1.1
750.	-.2	750.	.8	750.	0.0	750.	.2	800.	-2.2			700.	1.3	750.	-.3
800.	-.8	800.	.1	800.	-1.8	800.	-1.6	850.	-3.6			750.	-.1	800.	-1.9
850.	-1.5	850.	-1.5	850.	-3.8	850.	-3.2					800.	-1.8	850.	-3.2
900.	-2.5	900.	-3.3									850.	-3.5		
		950.	-5.2									900.	-3.7		
												950.	-5.4		

DATE 690216		DATE 700114		DATE 700121		DATE 700128		DATE 700204		DATE 700211		DATE 700218		DATE 700225	
SRVY	81	SRVY	82	SRVY	83	SRVY	84	SRVY	85	SRVY	86	SRVY	87	SRVY	88
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
0.	7.2	0.	7.2	0.	7.2	0.	7.2	0.	7.2	0.	7.2	0.	7.2	25.	4.2
25.	4.1	25.	4.1	25.	4.1	25.	4.1	25.	4.1	25.	4.3	25.	4.4	50.	3.5
50.	3.7	50.	3.9	50.	3.9	50.	3.7	50.	3.7	50.	3.7	50.	3.7	100.	2.6
100.	2.9	100.	3.1	100.	3.0	100.	2.9	100.	2.8	100.	2.9	100.	2.8	150.	2.7
150.	2.9	150.	3.0	150.	3.0	150.	2.8	150.	2.8	150.	2.9	150.	2.8	200.	2.8
200.	2.9	200.	3.2	200.	3.0	200.	2.8	200.	2.8	200.	2.8	200.	2.8	250.	2.9
250.	3.1	250.	3.2	250.	3.1	250.	2.9	250.	2.8	250.	3.0	250.	2.8	300.	3.2
300.	3.0	300.	3.2	300.	3.1	300.	3.0	300.	3.1	300.	3.3	300.	3.1	350.	3.9
350.	3.1	350.	3.1	350.	3.0	350.	2.9	350.	3.8	350.	4.1	350.	3.8	400.	4.5
400.	4.2	400.	3.3	400.	3.3	400.	3.2	400.	4.5	400.	4.7	400.	4.5	450.	5.0
450.	5.0	450.	3.4	450.	3.6	450.	3.3	450.	4.8	450.	5.1	450.	4.8	500.	5.4
500.	5.1	500.	3.2	500.	3.3	500.	3.0	500.	5.1	500.	5.2	500.	4.9	550.	5.0
550.	4.7	550.	3.2	550.	3.3	550.	3.6	550.	4.1	550.	4.5	550.	4.8	600.	3.6
600.	3.7	600.	2.9	600.	3.3	600.	3.9	600.	2.9	600.	3.0	600.	3.5	650.	2.0
650.	2.2	650.	2.6	650.	3.2	624.	3.7	650.	.4	650.	1.4	650.	2.5	700.	.7
700.	1.0	675.	2.4	700.	1.7	650.	2.7	700.	0.0	700.	0.0	700.	1.2	750.	*1.5
750.	-.8	700.	1.8	750.	.1	700.	.6	750.	*1.3	750.	*1.3	750.	-.4	800.	*2.4
800.	*2.0	750.	-.1	800.	*1.1	750.	-.9	800.	*1.8	780.	*2.0	800.	*1.9		
850.	*2.6	781.	-.6	850.	*2.1	800.	*2.1	850.	*2.6			850.	*2.1		
908.	*3.7	800.	*1.0	900.	*3.6	850.	*2.6								
		850.	*2.2												
		900.	*4.6												

DATE 700304		DATE 700311		DATE 700318		DATE 700325		DATE 700826		DATE 701015		DATE 701106		DATE 701209	
SRVY	89	SRVY	90	SRVY	91	SRVY	92	SRVY	93	SRVY	94	SRVY	95	SRVY	96
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
25.	4.3	25.	4.2	25.	4.3	25.	4.3	0.	7.2	25.	7.4	0.	7.2	25.	5.5
50.	3.6	50.	3.5	50.	3.4	50.	3.7	25.	7.4	50.	8.4	25.	6.4	50.	6.0
100.	2.8	100.	2.8	100.	2.8	75.	2.9	50.	8.6	100.	8.9	50.	8.1	100.	6.3
150.	2.8	150.	2.8	150.	2.8	100.	2.6	100.	8.9	150.	8.5	100.	9.1	150.	5.7
200.	2.8	200.	2.9	200.	2.8	150.	2.6	150.	8.9	200.	8.1	150.	8.8	200.	5.2
250.	2.9	250.	3.0	250.	3.0	200.	2.7	200.	8.3	250.	7.4	182.	8.4	250.	5.1
300.	3.1	300.	3.0	300.	3.2	250.	3.0	250.	7.5	300.	6.2	200.	7.4	300.	4.2
350.	4.0	350.	3.8	350.	4.0	300.	3.5	300.	6.3	350.	5.7	250.	5.7	350.	3.8
400.	5.0	400.	4.5	400.	4.7	350.	4.1	350.	5.8	400.	5.3	300.	5.1	400.	3.6
450.	5.0	450.	4.8	450.	5.1	400.	4.3	400.	5.4	450.	5.0	350.	4.8	450.	3.2
500.	5.4	500.	5.1	500.	5.3	450.	4.8	450.	5.0	500.	4.7	400.	4.6	500.	3.0
550.	5.0	550.	4.8	550.	5.1	500.	5.2	500.	4.8	550.	4.8	450.	4.4	550.	2.4
567.	5.4	600.	5.6	600.	5.5	560.	4.9	550.	4.9	600.	5.9	500.	4.2	600.	2.4
578.	4.0	650.	2.0	671.	-.1	571.	4.6	600.	6.0	628.	6.5	550.	3.9	650.	2.5
600.	4.4	700.	-.4	700.	-.5	600.	5.1	626.	6.7	650.	4.9	600.	4.1	700.	4.0
622.	4.7	750.	*1.6	750.	*1.4	638.	6.1	647.	5.0	700.	5.2	650.	3.9	750.	2.2
650.	1.6	800.	*1.8	800.	*1.7	680.	.1	700.	3.4	725.	5.6	700.	3.1	800.	.7
700.	-.4	850.	0.0	850.	*2.8	708.	*2.1	750.	2.3	750.	2.8	750.	2.1	850.	*1.2
750.	*1.8	900.	0.0	900.	*4.1	780.	*2.9	800.	1.1	800.	.9	800.	1.1		
800.	*2.5							850.	-.3	850.	-.1	850.	-.9		
								900.	*1.1	900.	*1.0	900.	*2.4		
								950.	*1.8	950.	*2.4				
								1000.	*3.0	1000.	*3.8				

DATE 701218		DATE 710113		DATE 710209		DATE 710311		DATE 710412		DATE 710607		DATE 710816		DATE 711004	
SRVY 97		SRVY 98		SRVY 99		SRVY 100		SRVY 101		SRVY 102		SRVY 103		SRVY 104	
TIME 1200		TIME 1800		TIME 1200		TIME 1200		TIME 1800		TIME 1200		TIME 1800		TIME 1200	
0.	7.8	25.	5.0	25.	5.2	25.	4.9	25.	5.0	25.	5.2	25.	5.2	25.	4.9
25.	6.1	50.	5.9	50.	6.0	50.	5.7	50.	5.1	50.	5.2	50.	5.1	50.	5.2
50.	6.6	100.	6.0	100.	6.4	100.	6.0	100.	4.5	100.	4.8	100.	4.3	100.	4.5
100.	7.2	150.	5.2	150.	5.6	150.	5.4	150.	4.1	150.	4.5	150.	3.9	150.	4.0
150.	6.5	200.	4.9	200.	5.2	200.	4.7	200.	3.9	200.	4.1	200.	3.8	200.	3.8
200.	5.8	250.	4.7	250.	4.8	250.	4.2	250.	3.6	250.	3.9	250.	3.7	250.	3.7
250.	5.3	300.	4.3	300.	4.5	300.	4.0	300.	3.6	300.	3.8	300.	3.7	300.	3.6
300.	5.1	350.	4.2	350.	4.2	350.	3.7	350.	3.4	350.	3.6	350.	3.5	350.	3.5
350.	5.0	400.	4.0	400.	3.9	400.	3.5	400.	3.4	400.	3.3	400.	3.5	400.	3.5
400.	4.9	450.	3.7	450.	3.9	450.	3.4	450.	3.5	450.	3.4	450.	3.7	450.	3.4
450.	4.8	500.	3.5	500.	4.3	500.	3.1	500.	3.4	500.	3.4	500.	3.7	500.	3.6
500.	4.7	550.	3.2	550.	4.4	550.	2.9	550.	3.1	550.	3.5	550.	3.9	550.	3.5
550.	4.6	600.	2.7	600.	4.1	600.	2.8	600.	2.6	600.	4.6	600.	5.1	600.	3.1
600.	4.2	650.	3.0	650.	3.1	650.	2.8	650.	2.4	650.	6.0	650.	6.5	650.	2.7
650.	3.6	700.	2.1	700.	1.8	700.	2.0	700.	1.9	700.	2.6	672.	6.7	700.	2.3
700.	2.9	750.	2.0	750.	.3	750.	1.0	750.	.6	720.	.7	700.	2.2	730.	1.7
750.	1.3	800.	.7	800.	-1.1	800.	-.5	800.	-1.3	750.	-.1	750.	-1.3	800.	-.9
800.	.5	850.	-1.2	850.	-2.2	850.	-1.6	850.	-3.0	800.	-1.6			850.	-3.4
850.	-.7	900.	-2.6							850.	-2.4				
875.	-1.3														

DATE 711213		DATE 720110		DATE 720214		DATE 720322		DATE 720317		DATE 720410		DATE 720821		DATE 721020	
SRVY 105		SRVY 106		SRVY 107		SRVY 108		SRVY 109		SRVY 110		SRVY 111		SRVY 112	
TIME 1200		TIME 1800		TIME 1200		TIME 1800		TIME 1800		TIME 1800		TIME 1300		TIME 1000	
25.	4.7	25.	4.6	25.	3.0	25.	3.7	25.	4.0	25.	4.6	25.	4.6	25.	4.0
50.	5.1	50.	4.8	50.	4.8	50.	4.3	50.	4.4	50.	4.5	50.	4.5	50.	4.1
100.	4.4	100.	4.1	100.	4.2	100.	4.3	100.	4.0	100.	4.2	100.	3.8	100.	3.3
150.	4.1	150.	4.0	150.	4.0	150.	4.0	150.	3.9	150.	3.9	150.	3.8	150.	3.4
200.	4.1	200.	4.0	200.	4.1	200.	3.9	200.	3.5	200.	3.9	200.	3.8	200.	3.5
250.	3.9	250.	3.8	250.	4.1	250.	3.9	250.	3.5	250.	3.9	250.	3.8	250.	3.5
300.	3.8	300.	3.8	300.	4.0	300.	3.9	300.	3.7	300.	3.9	300.	3.8	300.	3.6
350.	3.7	350.	3.8	350.	4.1	350.	3.9	350.	3.7	350.	3.9	350.	3.7	350.	3.7
400.	3.5	400.	3.8	400.	4.8	400.	3.7	400.	3.6	400.	4.1	400.	3.7	400.	3.6
450.	3.7	450.	3.8	450.	5.1	450.	3.2	450.	3.5	450.	4.3	450.	3.6	450.	3.8
500.	3.5	500.	3.7	500.	5.2	500.	2.9	500.	3.6	500.	4.4	500.	3.5	500.	3.8
550.	3.2	550.	4.2	550.	4.8	550.	2.5	550.	3.7	550.	4.8	550.	3.8	550.	3.9
600.	4.5	600.	5.3	600.	4.0	600.	2.2	600.	3.1	576.	5.5	600.	5.2	600.	3.7
650.	4.3	640.	6.1	650.	2.1	650.	1.8	650.	2.3	600.	4.1	650.	7.0	650.	3.3
680.	3.7	700.	.9	700.	.9	700.	1.3	700.	1.5	620.	4.1	660.	7.0	700.	2.9
700.	2.4	740.	-1.8	750.	-.6	750.	.7	750.	-.2	650.	1.6	700.	3.2	730.	1.2
750.	.7			800.	-2.5	800.	-.4	800.	-2.7	700.	-1.4	750.	-.3	800.	-.5
800.	-.8					850.	-1.8			725.	-2.2	800.	-2.0		
850.	-2.8														

DATE	721208
SRVY	113
TIME	1300
----	------
25.	4.3
50.	3.7
100.	3.2
150.	3.2
200.	3.4
250.	3.4
300.	3.4
350.	3.5
400.	3.4
450.	3.5
500.	5.2
550.	5.8
600.	5.4
619.	5.8
650.	1.3
690.	*1.6

DATE	730105
SRVY	114
TIME	1000
----	------
25.	3.5
50.	3.9
100.	3.5
150.	3.2
200.	3.2
250.	3.1
300.	3.3
350.	3.9
400.	3.4
450.	3.4
500.	3.4
550.	4.4
595.	4.7
600.	4.5
650.	2.3
700.	*.3
725.	*1.3

DATE	730216
SRVY	115
TIME	1000
----	------
25.	3.5
50.	3.5
100.	3.0
150.	3.0
200.	3.0
250.	3.0
300.	3.1
350.	3.1
400.	2.9
450.	2.8
500.	2.9
550.	2.6
600.	2.1
650.	1.7
700.	.8
750.	*.3
800.	*1.8

DATE	730316
SRVY	116
TIME	900
----	------
25.	3.7
50.	3.2
100.	2.8
150.	2.9
200.	3.0
250.	3.1
300.	3.2
350.	3.2
400.	3.2
450.	3.4
500.	3.7
550.	3.8
600.	3.3
650.	1.8
700.	.1
750.	*.3
800.	*1.0
850.	*2.0

DATE	730324
SRVY	117
TIME	700
----	------
25.	3.2
50.	3.1
100.	2.5
150.	2.4
200.	2.4
250.	2.3
300.	2.2
350.	2.2
400.	2.3
450.	2.1
500.	1.7
550.	1.3
600.	1.0
650.	1.2
700.	1.1
750.	.6
800.	*.6

DATE	730405
SRVY	118
TIME	1200
----	------
25.	3.2
50.	3.1
100.	2.5
150.	2.5
200.	2.5
250.	2.4
300.	2.3
350.	2.5
400.	2.6
450.	2.4
472.	2.3
500.	4.0
550.	4.3
600.	3.8
650.	2.1
700.	.5
750.	*.7
800.	*1.5
825.	*1.8
850.	*2.0

DATE	730418
SRVY	119
TIME	1100
----	------
25.	3.5
50.	3.2
100.	2.4
150.	2.4
200.	2.3
250.	2.2
300.	2.3
350.	2.2
400.	2.2
450.	2.2
500.	2.2
550.	2.4
600.	2.9
650.	2.5
700.	1.8
750.	.5
800.	*.5
850.	*1.8

DATE	621024
SRVY	1
TIME	1200
----	------
66.	7.3
82.	6.7
144.	2.6
191.	.5
238.	*.7
891.	*1.2

DATE	621101
SRVY	2
TIME	1200
----	------
65.	7.1
83.	5.7
143.	1.8
194.	.1
223.	*1.3
251.	*2.0

DATE	621109
SRVY	3
TIME	1200
----	------
65.	6.1
111.	3.3
145.	1.2
169.	.4
262.	*.7
316.	*2.3

DATE	621212
SRVY	4
TIME	1200
----	------
71.	5.3
82.	4.7
111.	1.8
184.	.4
203.	*2.3
331.	*1.3

DATE	630109
SRVY	5
TIME	1200
----	------
65.	5.9
75.	3.3
100.	2.3
125.	1.0
150.	.6
177.	*.1
228.	*1.1

DATE	630116
SRVY	6
TIME	1200
----	------
65.	5.8
74.	4.6
100.	3.3
125.	2.2
149.	.2
173.	*.5
201.	*.6
228.	*1.1

DATE	630122
SRVY	7
TIME	1200
----	------
65.	5.9
86.	4.6
100.	3.7
125.	2.3
150.	.8
175.	0.0
226.	*2.1

DATE	630130
SRVY	8
TIME	1200
----	------
64.	5.8
74.	4.8
100.	3.5
125.	2.4
150.	.8
200.	*.5
225.	*1.0

DATE 630205 SRVY 9 TIME 1800	DATE 630213 SRVY 10 TIME 1800	DATE 630221 SRVY 11 TIME 1800	DATE 630227 SRVY 12 TIME 1800	DATE 630307 SRVY 13 TIME 1800	DATE 630313 SRVY 14 TIME 1800	DATE 630321 SRVY 15 TIME 1800	DATE 630402 SRVY 16 TIME 1800
65. 5.8 99. 3.0 151. 1.0 200. .8 885. .0	66. 6.1 100. 4.3 125. 2.3 151. .0 182. .0 229. .1.2	65. 5.0 99. 3.0 150. 1.2 184. 0.0 275. .1.1	74. 5.2 100. 4.3 125. 1.9 175. 0.0 200. .4 225. .1.1	75. 5.1 100. 4.3 150. 3.3 200. 2.3 250. .8 300. .1.4 385.	66. 5.7 75. 5.0 100. 5.4 125. 4.7 150. 4.4 175. 3.8 200. 3.4 250. 1.5 300. .5 335. .1.1 376.	65. 6.8 100. 6.7 175. 6.0 250. 6.0 275. 7.2 326. 6.6 350. 5.9 359. 5.3 390. 4.3 400. 2.0 451. 1.7 475. .5 500. .1.5 526.	66. 7.0 77. 7.1 149. 6.5 175. 6.9 200. 6.6 224. 6.6 250. 6.5 300. 7.7 325. 6.4 350. 6.9 380. 6.2 400. 5.2 425. 1.4 450. .3 476. 0.0 526. .1.4

DATE 630523 SRVY 17 TIME 1800	DATE 630611 SRVY 18 TIME 1800	DATE 630626 SRVY 19 TIME 1800	DATE 630712 SRVY 20 TIME 1800	DATE 630724 SRVY 21 TIME 1800	DATE 630807 SRVY 22 TIME 1800	DATE 630823 SRVY 23 TIME 1800	DATE 630905 SRVY 24 TIME 1800
65. 7.1 100. 8.0 150. 8.8 200. 8.8 225. 9.8 250. 9.9 276. 8.5 300. 7.8 325. 8.1 350. 7.8 376. 5.1 401. 2.8 426. .1 451. .1 476. .4	65. 7.3 99. 7.8 150. 8.4 199. 8.8 224. 8.3 249. 8.3 277. 8.4 301. 7.7 325. 8.6 349. 2.5 374. 2.7 401. 1.7 426. 0.0 476. .0	277. 8.6 300. 7.8 325. 5.8 351. 3.2 375. 1.3 400. .5 426. 0.0 451. .0	66. 7.4 100. 7.9 142. 8.6 150. 8.5 177. 8.6 200. 8.5 225. 9.3 250. 9.0 276. 8.4 301. 7.9 327. 5.5 350. 3.1 376. .8 401. .1 426. .7	100. 8.5 150. 8.0 187. 8.7 225. 9.3 251. 9.1 276. 8.5 300. 7.8 326. 5.9 350. 3.5 375. 2.0 400. .8 450. .2 476. .1.0	65. 7.8 100. 8.0 141. 8.5 180. 8.8 203. 8.8 226. 9.4 251. 9.0 276. 8.3 300. 7.2 326. 5.5 351. 4.3 375. 2.3 426. 1.2 451. .7	141. 8.5 190. 8.8 201. 8.8 226. 9.3 251. 9.1 301. 8.8 325. 8.3 351. 8.3 376. 8.2 401. .7 451. .7	300. 8.1 324. 5.8 325. 3.4 351. 2.8

DATE	630925
SRVY	25
TIME	1200
----	------
100.	7.8
151.	9.0
175.	8.6
201.	8.8
227.	9.1
240.	8.9
245.	5.8
252.	4.9
277.	3.0
303.	1.4
328.	.3
353.	-.1

DATE	631009
SRVY	26
TIME	1200
----	------
-101.	7.4
-51.	7.4
0.	7.5
50.	8.4
63.	7.2
101.	7.9
144.	8.4
151.	9.0
177.	8.6
202.	8.8
226.	9.3
234.	8.9
252.	5.3
303.	1.5
328.	.4
352.	-.2
379.	-.6

DATE	631028
SRVY	27
TIME	1200
----	------
143.	8.7
151.	9.4
176.	8.6
201.	8.8
233.	9.4
238.	9.7
276.	8.5
302.	.7
338.	-1.1

DATE	631114
SRVY	28
TIME	1200
----	------
-101.	7.6
-51.	7.6
0.	7.5
50.	8.4
63.	7.3
143.	8.6
151.	8.6
177.	5.8
203.	3.9
252.	.5
276.	-.5
328.	-.8

DATE	631231
SRVY	29
TIME	1200
----	------
143.	8.6
151.	8.1
174.	7.3
202.	5.5
228.	4.0
252.	3.1
277.	2.7
302.	.8
326.	-.2
353.	-1.1
375.	-1.6
403.	-2.4

DATE	640117
SRVY	30
TIME	1200
----	------
-102.	7.6
-51.	7.5
-1.	7.5
59.	8.4
62.	7.4
125.	8.5
140.	8.8
147.	9.4
151.	7.4
201.	3.5
252.	1.6
303.	.3
352.	-3.0

DATE	640214
SRVY	31
TIME	1200
----	------
147.	9.5
150.	7.8
201.	4.1
252.	1.7
302.	-.4
353.	-2.7

DATE	640312
SRVY	32
TIME	1200
----	------
150.	8.5
176.	6.0
202.	5.5
227.	4.0
252.	1.8
279.	.1
304.	-1.7
321.	-2.1

DATE	640409
SRVY	33
TIME	1200
----	------
150.	8.5
176.	6.3
227.	3.9
277.	.2
327.	-3.0
352.	-2.8
377.	-2.6
453.	-2.6
478.	-2.8

DATE	640527
SRVY	34
TIME	1200
----	------
138.	8.6
144.	8.6
177.	7.0
201.	6.1
213.	5.7
226.	3.7
252.	1.3
277.	0.0
302.	-1.0
327.	-2.8

DATE	640624
SRVY	35
TIME	1200
----	------
141.	9.5
147.	7.7
191.	4.9
232.	3.2
271.	.5
301.	-.8
340.	-2.0

DATE	640831
SRVY	36
TIME	1200
----	------
63.	7.4
140.	8.9
165.	7.6
191.	6.8
221.	4.6
241.	2.7
267.	.7
302.	-.6
316.	-1.1
342.	-1.5

DATE	640925
SRVY	37
TIME	1200
----	------
-101.	7.5
-50.	7.5
0.	7.5
99.	8.4
63.	7.5
100.	6.0
141.	4.4
151.	3.3
161.	2.6
182.	1.9
191.	.9
201.	.8
226.	0.0

DATE	641203
SRVY	38
TIME	1200
----	------
141.	5.4
176.	4.7
201.	2.5
226.	1.3
252.	0.0
277.	-.6
302.	-1.5
327.	-2.4
352.	-3.2

DATE	650120
SRVY	39
TIME	1200
----	------
62.	7.4
142.	5.4
151.	4.7
176.	3.0
202.	2.1
252.	.4
278.	-.1
328.	-2.2
353.	-2.9

DATE	650428
SRVY	40
TIME	1200
----	------
62.	7.5
176.	6.2
227.	2.2
328.	-2.5
353.	-2.6

DATE	650908
SRVY	41
TIME	1200
----	------
62.	7.5
141.	6.9
151.	6.7
176.	7.0
202.	4.5
227.	2.0
252.	.4
277.	-.4
327.	-.9
377.	-1.9

DATE	651020
SRVY	42
TIME	1200
----	------
61.	7.4
141.	7.2
152.	5.9
176.	3.8
226.	1.0
303.	-.6
328.	-1.0
352.	-1.9
378.	-1.9

DATE	651220
SRVY	43
TIME	1200
----	------
136.	7.2
141.	7.0
152.	6.0
176.	4.4
201.	3.5
227.	1.8
252.	.8
277.	.3
302.	-.6
353.	-2.0
378.	-2.9
403.	-3.6

DATE	660128
SRVY	44
TIME	1200
----	------
139.	6.5
175.	3.3
225.	1.5
250.	-.3
296.	-.5
300.	-1.3
329.	-2.3

DATE	660329
SRVY	45
TIME	1200
----	------
139.	5.4
174.	3.5
200.	2.4
225.	.4
250.	-.7
276.	-1.3
300.	-2.0
330.	-2.9

DATE	660426
SRVY	46
TIME	1200
----	------
139.	2.7
149.	4.1
167.	4.2
225.	-.3
250.	-1.5
275.	-1.8
300.	-2.8

DATE	661103
SRVY	47
TIME	1200
----	------
140.	5.2
150.	4.8
200.	1.9
250.	-.3
276.	-.6

DATE	670118
SRVY	48
TIME	1200
----	------
150.	5.2
200.	2.7
225.	1.2
249.	0.0
275.	-.8
325.	-2.8

DATE	670503
SRVY	49
TIME	1200
----	------
139.	4.6
174.	2.7
225.	.3
250.	-.9
300.	-1.4
325.	-1.9
351.	-2.9
376.	-3.9

DATE	670915
SRVY	50
TIME	1200
----	------
140.	6.8
150.	7.0
168.	7.0
200.	4.4
225.	2.2
250.	.7
301.	-.6
324.	-1.8

DATE	670919
SRVY	51
TIME	1200
----	------
139.	5.5
200.	2.5
250.	.9
300.	-.5
350.	-2.3

DATE	671213
SRVY	52
TIME	1200
----	------
140.	4.3
175.	2.1
200.	1.1
225.	.4
250.	-.1
300.	-1.2
325.	-1.7
351.	-1.9
375.	-2.7

DATE	680118
SRVY	53
TIME	1200
----	------
139.	2.9
150.	2.7
200.	.6
250.	-1.0
300.	-1.4

DATE	680124
SRVY	54
TIME	1200
----	------
140.	3.9
151.	2.6
181.	.8
200.	.2
250.	-.4
300.	-1.6
326.	-2.5

DATE	680130
SRVY	55
TIME	1200
----	------
140.	3.4
150.	2.7
175.	1.5
200.	.9
225.	.4
250.	-.3
275.	-1.0
300.	-1.6
325.	-2.5

DATE	680206
SRVY	56
TIME	1200
----	------
139.	4.0
150.	3.4
200.	1.2
250.	-.5
275.	-1.2

DATE	680215
SRVY	57
TIME	1200
----	------
140.	4.3
151.	3.8
200.	.5
251.	0.0
301.	-1.8
350.	-3.0
400.	-4.1

DATE	680221
SRVY	58
TIME	1200
----	------
140.	4.7
150.	3.8
158.	3.5
179.	2.5
200.	1.1
225.	.8
250.	.2
275.	-.8
300.	-1.9
325.	-2.9

DATE	680226
SRVY	59
TIME	1200
----	------
140.	5.3
150.	4.2
153.	3.8
175.	2.3
200.	1.2
225.	.3
250.	-.6
275.	-1.4
300.	-2.0
325.	-2.7
350.	-3.5

DATE	680307
SRVY	60
TIME	1200
----	------
140.	3.9
150.	3.5
175.	2.6
200.	1.8
225.	.7
250.	-.3
275.	-1.1
300.	-1.7

DATE	680313
SRVY	61
TIME	1200
----	------
140.	3.9
152.	3.3
200.	1.3
250.	-.5
276.	-1.2
301.	-2.2

DATE	680322
SRVY	62
TIME	1200
----	------
141.	3.9
150.	3.4
175.	2.7
200.	1.0
251.	-.3
276.	-1.6
301.	-2.6

DATE	681007
SRVY	63
TIME	1200
----	------
140.	6.8
150.	7.0
167.	7.7
190.	5.7
200.	4.2
225.	1.9
250.	.5
275.	-.4
300.	-1.5
325.	-2.3
350.	-3.0

DATE	681025
SRVY	64
TIME	1200
----	------
140.	7.2
150.	7.3
175.	7.0
200.	6.0
225.	2.2
250.	.7
275.	-.5
300.	-1.5

DATE 681115 SRVY 65 TIME 1200		DATE 681220 SRVY 66 TIME 1200		DATE 690113 SRVY 67 TIME 1200		DATE 690122 SRVY 68 TIME 1200		DATE 690129 SRVY 69 TIME 1200		DATE 690205 SRVY 70 TIME 1200		DATE 690212 SRVY 71 TIME 1200		DATE 690219 SRVY 72 TIME 1200	
140.	3.9	140.	5.1	140.	4.3	140.	2.1	140.	2.1	140.	2.6	140.	2.9	140.	2.3
150.	3.4	150.	4.7	150.	3.7	150.	1.6	150.	1.7	150.	2.0	150.	2.2	150.	1.8
175.	2.5	175.	3.5	175.	2.5	175.	.7	175.	.9	175.	.9	175.	.7	175.	1.0
200.	1.6	200.	2.0	200.	1.0	200.	-.1	200.	-.2	200.	.3	200.	.2	200.	.2
225.	1.6	225.	.7	250.	-.6	225.	-.8	225.	-1.6	250.	-1.0	250.	-.7	225.	-.6
250.	0.0	250.	-.5	300.	-2.1	250.	-1.6	250.	-2.1	300.	-2.3	300.	-2.5	250.	-1.2
275.	-.2	275.	-1.7	350.	-8.5			275.	-2.6	350.	-3.7	350.	-3.2	275.	-1.9
300.	-1.5	300.	-2.3					300.	-2.0	400.	-4.8			300.	-2.2
325.	-2.7	325.	-3.1					325.	-2.6					325.	-2.8
350.	-3.5														

DATE 690226 SRVY 73 TIME 1200		DATE 690305 SRVY 74 TIME 1200		DATE 690312 SRVY 75 TIME 1200		DATE 690319 SRVY 76 TIME 1200		DATE 690527 SRVY 77 TIME 1200		DATE 690903 SRVY 78 TIME 1200		DATE 691023 SRVY 79 TIME 1200		DATE 691120 SRVY 80 TIME 1200	
140.	2.3	140.	1.8	140.	1.6	140.	2.4	140.	3.8	140.	9.9	140.	5.6	140.	4.7
150.	1.4	150.	1.6	150.	.9	150.	2.0	150.	3.1	150.	4.8	150.	4.8	150.	3.5
175.	-.4	175.	.7	175.	.2	175.	1.1	200.	.1	200.	1.0	175.	3.0	175.	3.1
200.	-.8	200.	-.2	200.	.2	200.	.5	250.	.2	250.	-.5	200.	-1.7	200.	1.8
225.	-1.4	225.	-1.2	225.	-.4	250.	-.9	300.	-1.3	300.	-1.6	250.	-.2	225.	.8
250.	-1.6	250.	-2.4	250.	-1.0	300.	-2.6	350.	-2.7			300.	-2.1	250.	0.0
275.	-1.8	300.	-3.3	275.	-1.7	350.	-3.3					350.	-4.8	270.	-1.0
300.	-3.0	350.	-3.6	300.	-2.1							400.	-6.0	300.	-2.0
		400.	-3.8	325.	-2.6									325.	-3.1
		450.	-5.4	350.	-3.3										
				400.	-4.3										

DATE 691216 SRVY 81 TIME 1200		DATE 700114 SRVY 82 TIME 1200		DATE 700121 SRVY 83 TIME 1200		DATE 700128 SRVY 84 TIME 1200		DATE 700204 SRVY 85 TIME 1200		DATE 700211 SRVY 86 TIME 1200		DATE 700218 SRVY 87 TIME 1200		DATE 700225 SRVY 88 TIME 1200	
140.	3.5	140.	3.2	140.	3.8	140.	3.9	140.	1.5	140.	2.4	140.	2.8	140.	3.3
150.	2.9	150.	2.9	150.	3.4	150.	3.3	150.	1.1	150.	1.9	150.	2.5	157.	2.9
200.	.9	200.	1.1	200.	1.1	175.	1.8	200.	-.7	200.	.1	175.	1.7	185.	.1
250.	-.2	250.	-.8	250.	-.8	200.	.9	250.	-1.7	250.	-1.4	200.	.9	200.	0.0
300.	-1.3	300.	-1.9	300.	-1.9	250.	-.7	300.	-2.7	300.	-1.8	225.	-1.4	225.	-.1
350.	-2.9	330.	-2.8	350.	-3.5	300.	-2.1	350.	-2.7	340.	-2.4	250.	-1.3	250.	0.0
375.	-3.6	400.	-4.6			350.	-2.9					300.	-.9	275.	-.8
												350.	-2.0	300.	-1.6
														350.	-3.2

DATE 700304	
SRVY	A9
TIME	1200
----	------
140.	4.3
150.	3.8
200.	1.3
250.	.6
300.	-1.5
341.	-2.8

DATE 700311	
SRVY	A0
TIME	1200
----	------
140.	4.4
150.	4.0
200.	.9
250.	-.5
300.	-1.5
330.	-2.8
400.	-4.9

DATE 700318	
SRVY	A1
TIME	1200
----	------
140.	4.3
150.	3.5
200.	.8
250.	-.3
300.	-1.9
350.	-3.5
380.	-4.6

DATE 700518	
SRVY	A2
TIME	1200
----	------
140.	5.1
154.	4.3
198.	.8
200.	0.0
850.	-2.2

DATE 700626	
SRVY	A3
TIME	1200
----	------
140.	7.3
150.	7.9
200.	8.0
250.	7.8
300.	8.1
340.	9.2
368.	9.2
400.	3.3
426.	1.0
450.	0.0
500.	-1.2
550.	-2.4
600.	-4.3

DATE 701015	
SRVY	A4
TIME	1200
----	------
140.	7.4
150.	8.0
200.	7.9
250.	7.8
300.	8.3
332.	9.3
338.	6.2
350.	3.8
400.	.8
450.	0.0
500.	-2.3
550.	-3.5

DATE 701106	
SRVY	A5
TIME	1200
----	------
140.	7.9
150.	8.1
200.	8.4
250.	6.2
300.	2.9
350.	.9
400.	-.4
450.	-.8
483.	-2.1

DATE 701209	
SRVY	A6
TIME	1200
----	------
140.	7.8
150.	8.2
200.	8.3
250.	5.7
300.	2.7
350.	.6
400.	-1.9

DATE 701218	
SRVY	A7
TIME	1200
----	------
140.	8.3
150.	8.4
173.	8.3
200.	6.2
250.	3.6
300.	1.5
350.	.3
375.	-.6

DATE 710113	
SRVY	A8
TIME	1200
----	------
140.	8.0
150.	8.3
200.	5.3
250.	3.3
300.	.7
330.	-1.4
395.	-3.1

DATE 710209	
SRVY	A9
TIME	1200
----	------
140.	8.5
150.	8.4
161.	7.8
162.	7.2
200.	4.2
250.	1.5
300.	-.1
350.	-1.8
375.	-2.4

DATE 710311	
SRVY	A0
TIME	1200
----	------
140.	8.5
150.	8.1
200.	6.9
250.	1.6
300.	-1.7

DATE 710412	
SRVY	A1
TIME	1200
----	------
140.	5.8
150.	5.3
200.	3.7
235.	3.9
250.	.8
300.	-2.2
350.	-2.6
400.	-3.0

DATE 710607	
SRVY	A2
TIME	1200
----	------
140.	6.1
150.	6.4
172.	7.0
200.	5.4
225.	3.0
250.	.9
300.	-3.1
350.	-5.1

DATE 710816	
SRVY	A3
TIME	1200
----	------
140.	6.7
150.	7.1
195.	6.7
250.	1.1
330.	-1.9

DATE 711004	
SRVY	A4
TIME	1200
----	------
140.	8.1
150.	8.2
200.	3.1
250.	1.2
300.	-2.2
350.	-2.3
400.	-3.3

DATE 711213	
SRVY	A5
TIME	1200
----	------
140.	8.2
150.	8.1
160.	6.0
200.	5.0
213.	4.3
250.	.3
300.	-1.6
350.	-2.0

DATE 720110	
SRVY	A6
TIME	1200
----	------
140.	8.2
150.	8.2
164.	7.5
200.	5.2
250.	0.0
300.	-1.7

DATE 720214	
SRVY	A7
TIME	1200
----	------
140.	4.0
150.	3.6
200.	1.6
250.	-.2
300.	-1.8
350.	-3.2

DATE 720322	
SRVY	A8
TIME	1200
----	------
140.	3.3
150.	2.8
200.	1.1
250.	-.4
275.	-1.0

DATE 720317	
SRVY	A9
TIME	1200
----	------
140.	4.5
150.	3.9
200.	1.6
250.	-.3
300.	-2.3

DATE 720410	
SRVY	A0
TIME	1200
----	------
140.	5.0
150.	5.1
174.	4.8
200.	1.9
250.	-1.0
275.	-1.8

DATE 720821	
SRVY	A1
TIME	1300
----	------
140.	7.1
150.	7.3
161.	7.4
167.	6.1
175.	5.0
200.	4.3
225.	1.2
250.	-.2
300.	-2.3

DATE 721020	
SRVY	A2
TIME	1000
----	------
140.	5.1
150.	4.6
200.	1.7
250.	-.9
275.	-1.6

DATE	721208
BRVY	113
TIME	1300
----	------
140.	5.8
150.	5.9
175.	4.4
200.	1.7
225.	-.5
250.	-1.7

DATE	730105
BRVY	114
TIME	1000
----	------
140.	5.1
150.	4.8
175.	1.3
200.	-1.4

DATE	730816
BRVY	115
TIME	1000
----	------
140.	4.1
150.	3.4
175.	8.0
800.	-1.8

DATE	730316
BRVY	116
TIME	900
----	------
140.	4.6
150.	3.7
175.	1.4
800.	-2.0

DATE	730325
BRVY	117
TIME	800
----	------
140.	4.7
150.	3.5
175.	1.2
200.	-1.2
213.	-2.8

DATE	730805
BRVY	118
TIME	1300
----	------
140.	4.5
150.	3.2
175.	.8
200.	-1.5
225.	-2.2

DATE	730418
BRVY	119
TIME	1200
----	------
140.	5.2
150.	5.0
175.	2.9
200.	1.0
225.	-.6
250.	-1.8
275.	-2.4

DATE	621024
BRVY	1
TIME	1200
----	------
15.	8.8
33.	9.4
77.	8.5
117.	7.1
169.	5.9
223.	4.1
280.	1.0
345.	-.7
411.	-1.7

DATE	621101
BRVY	2
TIME	1800
----	------
17.	8.8
34.	9.3
77.	8.4
118.	6.8
167.	5.8
217.	4.0
268.	1.8
281.	1.3
319.	.3
388.	-.9

DATE	621109
BRVY	3
TIME	1200
----	------
36.	8.3
101.	7.3
168.	5.5
233.	4.1
298.	1.7
382.	0.0
466.	-1.8
508.	-2.6
568.	-3.4

DATE	621212
BRVY	4
TIME	1200
----	------
-9.	9.0
41.	8.7
145.	5.1
215.	2.1
284.	2.1
357.	-1.0
418.	-2.4
497.	-4.1

DATE	630109
BRVY	5
TIME	1200
----	------
-1.	9.6
25.	9.0
50.	8.7
75.	8.4
101.	7.4
126.	6.6
150.	5.9
201.	4.4
251.	2.7
301.	1.2
350.	-.1
377.	-.4
401.	-1.0
425.	-1.2

DATE	630116
BRVY	6
TIME	1200
----	------
27.	8.9
73.	8.8
100.	7.5
151.	6.1
175.	5.8
200.	4.6
249.	2.6
299.	.8
326.	.6
350.	.1
378.	0.0
401.	-.4
425.	-1.2

DATE	630122
BRVY	7
TIME	1200
----	------
151.	6.0
201.	5.0
248.	2.8
301.	.8
329.	.4
350.	-.1
400.	-.6

DATE	630130
BRVY	8
TIME	1200
----	------
-1.	9.6
50.	8.6
75.	8.2
101.	7.3
126.	6.7
175.	5.5
226.	3.5
250.	2.7
275.	2.3
288.	3.2
290.	1.9
300.	1.4
326.	.8
351.	0.0
376.	-.5
401.	-.6
426.	-1.8

DATE 630205	
BRVY 9	
TIME 1200	
----	------
0.	9.6
24.	9.0
49.	8.6
75.	8.3
100.	7.5
126.	6.9
150.	6.0
177.	5.4
201.	4.5
223.	3.6
251.	2.7
276.	1.7
301.	1.0
325.	.2
351.	-.2
376.	-.7
400.	-1.8

DATE 630213	
BRVY 10	
TIME 1200	
----	------
50.	8.6
75.	8.4
99.	7.8
126.	6.9
150.	6.0
181.	5.4
200.	4.9
250.	3.0
301.	.8
341.	-.1
376.	-1.8

DATE 630221	
BRVY 11	
TIME 1200	
----	------
-1.	9.6
25.	8.8
75.	8.3
100.	7.5
150.	6.1
176.	5.0
202.	4.2
227.	3.7
250.	2.9
277.	1.9
301.	1.3
326.	.4
350.	0.0
375.	-.7
400.	-1.4

DATE 630227	
BRVY 12	
TIME 1200	
----	------
-1.	9.6
24.	8.9
49.	8.6
74.	8.3
125.	6.8
150.	6.1
175.	5.1
199.	4.2
225.	4.1
276.	2.0
300.	.9
326.	.5
350.	0.0
375.	-.9
400.	-1.3

DATE 630307	
BRVY 13	
TIME 1200	
----	------
125.	6.7
151.	6.0
176.	5.2
200.	4.8
227.	3.7
250.	2.5
275.	1.8
301.	.7
327.	0.0
351.	-.5
376.	-1.3

DATE 630313	
BRVY 14	
TIME 1200	
----	------
-1.	9.6
23.	8.9
50.	8.5
74.	8.4
100.	7.5
150.	6.2
176.	5.5
200.	4.6
251.	2.3
301.	.8
350.	-.7
377.	-1.4

DATE 630321	
BRVY 15	
TIME 1200	
----	------
75.	8.4
100.	7.3
150.	6.0
171.	5.5
200.	4.5
250.	2.2
301.	.2
325.	-.4
351.	-1.4

DATE 630402	
BRVY 16	
TIME 1200	
----	------
150.	6.1
175.	5.3
225.	3.0
251.	1.7
301.	.3
325.	-.4
350.	-.8
376.	-1.7

DATE 630523	
BRVY 17	
TIME 1200	
----	------
-1.	10.0
50.	9.0
100.	9.5
150.	10.4
200.	9.5
251.	10.3
300.	8.5
340.	6.8
342.	4.5
374.	1.8
400.	.9
451.	-.3
501.	-1.5

DATE 630611	
BRVY 18	
TIME 1200	
----	------
0.	10.1
50.	8.9
100.	9.6
149.	10.5
200.	9.9
250.	10.2
275.	9.8
330.	7.8
352.	3.4
375.	2.1
427.	.7
474.	-.7
500.	-1.2

DATE 630626	
BRVY 19	
TIME 1200	
----	------
158.	10.4
200.	9.8
250.	10.2
275.	9.6
325.	7.7
335.	5.2
350.	3.6
374.	1.9
449.	0.0
476.	-1.0

DATE 630712	
BRVY 20	
TIME 1200	
----	------
0.	10.1
50.	8.9
100.	9.6
150.	10.6
175.	10.3
200.	9.8
250.	10.1
275.	9.4
310.	7.8
324.	5.5
372.	2.8
401.	1.0
450.	-.6

DATE 630724	
BRVY 21	
TIME 1200	
----	------
-1.	10.1
25.	8.9
50.	8.9
99.	9.5
149.	10.5
176.	10.3
200.	9.8
250.	10.3
300.	8.8
325.	7.0
349.	4.5
373.	2.8
400.	1.8
429.	1.2
451.	.5
501.	-.4

DATE 630807	
BRVY 22	
TIME 1200	
----	------
0.	10.0
25.	8.9
51.	8.9
100.	9.6
125.	10.3
150.	10.5
200.	9.8
250.	10.1
276.	9.5
301.	8.7
325.	6.9
350.	4.7
401.	2.2
451.	.5
501.	-.2
527.	-.6

DATE 630823	
BRVY 23	
TIME 1200	
----	------
126.	10.3
150.	10.6
176.	10.4
199.	9.9
227.	10.0
250.	10.1
276.	9.5
300.	8.7
325.	7.1
350.	5.0
377.	3.7
400.	2.3
425.	1.2
452.	.6
501.	-.9

DATE 630903	
BRVY 24	
TIME 1200	
----	------
225.	10.0
250.	10.3
300.	9.0
325.	7.8
350.	4.8
375.	2.9
401.	2.2

DATE 630925		DATE 631009		DATE 631028		DATE 631114		DATE 631231		DATE 640117		DATE 640214		DATE 640312	
BRVY 25		BRVY 26		BRVY 27		BRVY 28		BRVY 29		BRVY 30		BRVY 31		BRVY 32	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
---- ------		---- ------		---- ------		---- ------		---- ------		---- ------		---- ------		---- ------	
76.	9.8	-1.	9.8	175.	9.8	-1.	9.9	-1.	9.9	0.	10.0	50.	8.8	0.	9.9
101.	9.7	25.	9.8	201.	9.8	24.	9.9	24.	9.8	50.	8.8	101.	9.4	50.	9.9
125.	10.5	50.	9.0	227.	10.0	50.	9.0	50.	9.8	101.	9.5	151.	10.2	100.	9.4
175.	9.8	76.	9.5	252.	9.8	74.	9.3	74.	9.9	151.	10.5	201.	9.7	151.	10.5
201.	9.8	125.	10.4	276.	9.2	125.	10.3	100.	9.3	201.	10.5	252.	10.0	201.	9.5
227.	10.0	151.	10.3	327.	9.3	151.	10.2	151.	10.2	252.	9.6	287.	9.4	251.	10.0
252.	9.5	175.	9.9	354.	8.3	176.	9.7	177.	10.0	276.	9.1	302.	9.7	281.	9.2
277.	8.3	202.	10.0	404.	8.3	201.	9.9	201.	9.5	277.	8.1	352.	9.0	302.	9.2
303.	9.2	227.	10.3	428.	9.8	226.	9.7	237.	9.8	301.	5.8	403.	1.5	326.	5.1
328.	4.5	253.	9.8	454.	11.0	251.	9.7	252.	9.9	353.	3.2	454.	.8	353.	2.6
354.	3.1	303.	4.8			277.	8.8	276.	9.7	403.	1.0	504.	.8	377.	1.5
404.	.1	328.	3.4			302.	4.4	301.	6.9	454.	.2	555.	.3	403.	.9
428.	.8	353.	1.5			353.	1.3	312.	5.8	504.	.3			454.	.4
		402.	.3			403.	.7	327.	5.4	555.	.3			504.	.4
		428.	.5			428.	.1.0	352.	1.3					530.	.1.4
		454.	.9					378.	1.8					542.	.2.6
								403.	1.2						
								427.	1.1						
								479.	.4						
								529.	.3.0						

DATE 640327		DATE 640428		DATE 640531		DATE 640925		DATE 641203		DATE 650120		DATE 650428	
BRVY 33		BRVY 35		BRVY 36		BRVY 37		BRVY 38		BRVY 39		BRVY 40	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
---- ------		---- ------		---- ------		---- ------		---- ------		---- ------		---- ------	
-1.	9.9	-1.	9.9	0.	9.5	0.	9.4	0.	9.8	0.	10.4	0.	9.7
50.	9.8	50.	9.1	50.	8.9	50.	8.9	50.	8.9	85.	9.0	40.	9.0
100.	9.6	100.	9.9	100.	9.3	100.	9.5	100.	9.5	141.	9.5	105.	9.9
151.	10.3	151.	10.4	151.	10.3	150.	10.4	151.	10.1	191.	10.4	164.	10.4
201.	9.5	201.	9.3	201.	9.6	201.	9.6	201.	9.4	241.	9.7	212.	9.5
251.	10.4	252.	9.8	251.	9.8	251.	9.4	241.	8.9	292.	8.5	267.	7.7
275.	9.7	267.	8.6	301.	4.8	251.	8.3	251.	8.0	302.	8.4	301.	4.0
292.	8.0	302.	5.8	339.	4.8	279.	8.6	301.	4.6	342.	6.7	313.	3.1
304.	5.3	352.	8.8	352.	3.7	301.	4.7	352.	2.1	393.	2.8	363.	2.1
352.	2.4	402.	.3	402.	1.0	352.	2.6	402.	.1	444.	1.3	413.	1.8
402.	.1	452.	.1.5	452.	.4	402.	1.0	452.	.1.5	494.	.1.0		
452.	.1.4	476.	.8.1	480.	.1.0	452.	.1.1	485.	.2.2	544.	.1.4		
504.	.3.3			503.	.1.0	495.	.2.1			560.	.8.7		

DATE	650908
BRVY	41
TIME	1200
----	------
50.	8.9
100.	9.6
151.	10.2
252.	8.1
352.	1.8
403.	.1
453.	-1.3
504.	-1.8
589.	-2.1

DATE	651029
BRVY	42
TIME	1200
----	------
0.	10.1
51.	9.1
101.	9.8
151.	10.4
201.	9.4
252.	8.4
301.	3.8
352.	1.4
403.	-.5
453.	-2.0

DATE	651220
BRVY	43
TIME	1200
----	------
0.	10.1
50.	8.1
101.	9.8
151.	10.5
201.	9.7
252.	8.4
268.	7.6
302.	5.4
352.	2.9
403.	1.0
453.	-.2
503.	-2.6

DATE	660124
BRVY	44
TIME	1200
----	------
0.	10.2
50.	8.9
100.	9.5
150.	10.4
201.	8.7
250.	6.0
301.	4.2
351.	2.0
402.	.9
453.	.1
503.	-1.0
552.	-2.0

DATE	660320
BRVY	45
TIME	1200
----	------
200.	8.7
251.	4.9
301.	3.7
352.	1.4
402.	.3
453.	-1.1
503.	-2.1

DATE	660426
BRVY	46
TIME	1200
----	------
100.	9.5
151.	10.3
200.	8.1
251.	4.9
301.	2.5
352.	.8
402.	-.6
452.	-1.0
502.	-1.9

DATE	661103
BRVY	47
TIME	1200
----	------
0.	10.4
49.	8.9
100.	9.8
151.	10.3
166.	10.3
201.	8.2
252.	6.3
302.	4.2
352.	1.8
403.	-.3
438.	-1.5

DATE	670118
BRVY	48
TIME	1200
----	------
0.	10.3
51.	8.9
100.	9.7
151.	10.3
201.	7.9
239.	5.4
252.	5.2
277.	4.0
302.	2.7
327.	1.2
353.	.1
402.	-1.4

DATE	670503
BRVY	49
TIME	1200
----	------
0.	10.6
51.	9.0
101.	9.5
151.	10.3
176.	10.0
181.	7.2
227.	5.1
252.	4.2
277.	1.9
302.	.7
353.	.1
371.	0.0
402.	-.4
453.	-1.5
502.	-2.9

DATE	670915
BRVY	50
TIME	1200
----	------
0.	10.4
50.	9.0
100.	9.6
151.	10.4
178.	9.7
191.	7.1
201.	6.3
251.	6.1
301.	5.8
351.	3.9
401.	.3
450.	-1.1
500.	-1.1

DATE	670919
BRVY	51
TIME	1200
----	------
0.	10.1
50.	8.9
100.	9.4
150.	10.2
200.	8.6
236.	5.6
250.	4.9
300.	3.6
350.	1.3
400.	.3
451.	-1.1
500.	-2.1

DATE	671213
BRVY	52
TIME	1200
----	------
50.	9.0
100.	9.6
150.	10.1
171.	10.1
173.	7.8
200.	5.7
231.	3.2
301.	1.0
351.	-.3
400.	-1.6
450.	-2.8

DATE	680115
BRVY	53
TIME	1200
----	------
0.	10.5
50.	9.0
100.	9.5
142.	10.2
145.	6.2
150.	6.2
200.	4.7
251.	2.8
300.	1.2
350.	.2
400.	-1.0
450.	-1.9

DATE	680124
BRVY	54
TIME	1200
----	------
0.	10.5
50.	9.0
100.	9.7
141.	10.2
145.	7.0
150.	6.5
200.	4.8
237.	4.1
250.	3.0
300.	.9
336.	-.3
350.	-.4
400.	-1.5
425.	-2.3

DATE	680130
BRVY	55
TIME	1200
----	------
0.	10.5
50.	9.1
100.	9.7
150.	10.2
155.	9.0
200.	5.2
250.	2.5
300.	.5
350.	-.4
400.	-1.2
450.	-1.4
500.	-2.4

DATE	680208
BRVY	56
TIME	1200
----	------
0.	10.5
50.	9.0
100.	9.7
141.	10.1
144.	6.6
150.	6.6
200.	4.8
250.	2.4
300.	.8
325.	.4

DATE	680215
SRVY	57
TIME	1800
----	------
0.	10.8
50.	8.8
100.	9.7
138.	9.8
144.	6.4
200.	4.2
225.	3.8
251.	2.1
300.	.7
350.	.3
400.	-.3
450.	-1.9

DATE	680221
SRVY	5A
TIME	1800
----	------
0.	10.8
50.	8.8
100.	9.9
137.	9.9
146.	6.5
150.	6.0
201.	4.1
250.	1.9
300.	.9
350.	.1
400.	-1.4
425.	-1.9

DATE	680226
SRVY	59
TIME	1800
----	------
-1.	10.8
50.	8.9
100.	9.9
137.	10.0
145.	6.6
191.	6.3
200.	4.3
250.	2.4
300.	1.0
351.	0.0
400.	0.0
500.	-1.9

DATE	680307
SRVY	60
TIME	1800
----	------
0.	10.3
50.	8.9
100.	9.7
138.	10.1
142.	6.7
200.	4.4
250.	3.0
300.	.7
351.	-.3
426.	-1.6

DATE	680313
SRVY	61
TIME	1800
----	------
0.	10.5
50.	8.9
100.	9.6
138.	10.0
141.	7.0
200.	4.5
250.	2.6
300.	.7
350.	-.7
400.	-1.6
450.	-3.3

DATE	680322
SRVY	62
TIME	1800
----	------
-1.	10.9
49.	8.8
100.	9.6
138.	10.0
143.	7.1
147.	6.9
150.	4.9
250.	.9
300.	.4
350.	-1.4

DATE	681007
SRVY	63
TIME	1800
----	------
0.	10.4
50.	8.9
100.	9.4
133.	9.8
153.	7.4
200.	5.8
250.	5.8
275.	2.6
300.	1.1
350.	-.9
400.	-2.0
450.	-2.6

DATE	681025
SRVY	64
TIME	1200
----	------
0.	10.4
50.	9.0
100.	9.5
143.	9.9
175.	6.4
200.	6.0
222.	6.1
225.	5.5
250.	3.3
275.	2.1
300.	1.3
350.	.1
375.	-.6

DATE	681115
SRVY	65
TIME	1200
----	------
0.	10.5
50.	9.0
100.	9.5
108.	9.3
150.	6.9
200.	4.8
250.	3.0
300.	1.4
350.	-.1
400.	-1.7
450.	-2.7

DATE	681220
SRVY	66
TIME	1200
----	------
0.	10.5
50.	9.0
100.	9.3
125.	8.4
150.	7.2
175.	6.2
200.	5.2
250.	2.5
300.	.7
350.	-1.0
400.	-2.4
425.	-2.9

DATE	690113
SRVY	67
TIME	1200
----	------
0.	10.6
50.	9.1
100.	9.4
106.	9.2
125.	8.0
150.	6.6
175.	5.2
200.	4.0
250.	1.5
300.	-.1
350.	-1.6
400.	-3.1

DATE	690122
SRVY	6A
TIME	1200
----	------
0.	10.6
50.	9.0
100.	9.4
107.	9.4
109.	6.5
150.	5.4
200.	3.8
250.	2.3
300.	.6
350.	-.7
379.	-1.7

DATE	690129
SRVY	69
TIME	1200
----	------
0.	10.5
50.	9.1
100.	9.5
104.	9.5
108.	6.4
150.	5.1
200.	3.6
230.	2.6
250.	1.6
300.	-.1
350.	-1.4
400.	-1.9
425.	-2.7

DATE	690205
SRVY	70
TIME	1200
----	------
0.	10.8
50.	9.0
100.	9.3
106.	8.9
110.	6.5
150.	5.2
200.	3.7
250.	1.5
300.	-.1
350.	-.9
400.	-1.9
450.	-2.7
500.	-3.8

DATE	690212
SRVY	71
TIME	1800
----	------
0.	10.6
50.	9.0
100.	9.3
100.	8.8
111.	6.4
125.	6.0
150.	5.2
175.	4.9
200.	4.1
250.	1.5
300.	.2
350.	-.7
400.	-1.7
450.	-2.6
500.	-3.1

DATE	690219
SRVY	72
TIME	1200
----	------
0.	10.5
50.	9.0
99.	9.4
101.	7.2
130.	5.6
200.	4.2
250.	2.6
300.	.8
350.	-.6
400.	-1.6
450.	-2.1

DATE 690226		DATE 690305		DATE 690312		DATE 690319		DATE 690325		DATE 691120		DATE 691216	
SRVY 73		SRVY 74		SRVY 75		SRVY 76		SRVY 79		SRVY 80		SRVY 81	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
0.	10.4	0.	10.4	0.	10.4	0.	10.7	0.	10.2	0.	10.3	0.	10.3
50.	9.0	50.	8.7	50.	9.0	50.	8.9	50.	8.9	25.	8.9	50.	9.0
98.	8.3	97.	9.0	96.	9.2	96.	9.0	100.	9.3	50.	9.1	91.	9.1
100.	7.6	100.	7.9	98.	9.2	98.	7.6	150.	6.7	92.	7.4	97.	8.4
150.	5.8	150.	5.6	150.	5.8	150.	6.5	200.	6.5	101.	6.1	150.	6.2
200.	5.0	200.	4.9	200.	4.2	200.	4.5	250.	6.2	150.	6.2	200.	6.0
250.	3.8	227.	1.9	250.	1.0	250.	1.4	300.	5.4	200.	5.3	250.	5.7
300.	0.0	250.	1.2	300.	.1	300.	.2	350.	1.4	262.	5.0	300.	5.1
350.	-1.4	300.	.1	350.	-1.0	350.	-1.0	400.	0.0	275.	4.2	350.	4.5
400.	-2.1	350.	-1.3	400.	-1.9	400.	-2.5	450.	-1.4	300.	1.2	400.	1.6
		400.	-2.3	450.	-3.0					350.	1.2	450.	1.7
		450.	-3.9							400.	.7	500.	1.8
		500.	-3.9							450.	-.4		
		550.	-3.7							500.	-.3		
		600.	-3.8							550.	-.5		

DATE 700118		DATE 700121		DATE 700128		DATE 700204		DATE 700211		DATE 700216		DATE 700225		DATE 700304	
SRVY A2		SRVY B3		SRVY A4		SRVY B5		SRVY A6		SRVY B7		SRVY B8		SRVY B9	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
0.	10.5	0.	10.7	0.	10.5	0.	10.5	0.	10.5	0.	10.4	0.	10.4	0.	10.5
50.	8.9	50.	8.9	50.	9.0	30.	8.9	23.	8.8	50.	8.8	50.	8.8	50.	8.8
91.	9.0	97.	9.3	96.	9.1	50.	9.0	91.	9.1	90.	8.6	90.	8.8	94.	8.8
100.	8.5	100.	8.7	99.	8.4	89.	9.2	100.	8.4	100.	7.1	100.	8.3	100.	8.3
125.	7.0	150.	6.0	150.	5.8	100.	8.6	150.	5.3	125.	5.9	126.	6.2	150.	6.7
150.	5.8	200.	4.4	200.	4.3	114.	7.6	200.	3.1	150.	5.1	150.	5.5	174.	5.6
200.	4.2	250.	2.1	250.	2.0	115.	6.9	250.	1.0	175.	3.6	172.	4.9	200.	4.6
250.	2.2	300.	.8	300.	.8	150.	5.5	300.	.7	200.	1.4	200.	3.4	250.	1.0
300.	2.4	350.	-.4	350.	-.9	200.	3.3	350.	-1.8	250.	.2	250.	.7	300.	.2
350.	-1.0	400.	-1.7	400.	-2.6	250.	1.1	400.	-2.5	300.	-1.2	300.	-1.2	350.	-1.3
400.	-2.9					300.	-.1			350.	-1.7	350.	-1.5	400.	-2.0
500.	-3.7					350.	-1.0			400.	-2.4	400.	-2.4		
						400.	-2.9								

DATE 700311		DATE 700318		DATE 700518		DATE 700826		DATE 701015		DATE 701106		DATE 701209		DATE 701218	
BRVY	90	BRVY	91	BRVY	92	BRVY	93	BRVY	94	BRVY	95	BRVY	96	BRVY	97
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
0.	10.4	0.	10.5	0.	10.5	0.	10.3	0.	10.2	0.	10.4	0.	10.4	0.	10.4
50.	9.0	50.	9.0	50.	8.8	50.	8.9	50.	8.9	50.	8.8	50.	8.9	14.	9.8
93.	9.0	92.	8.9	87.	9.0	88.	8.9	100.	8.2	86.	9.0	100.	8.4	50.	8.9
100.	8.6	150.	5.6	100.	8.1	115.	7.6	150.	8.2	100.	8.3	150.	7.9	86.	9.1
150.	5.8	200.	3.8	117.	6.5	150.	8.3	172.	8.6	119.	7.5	200.	9.9	100.	8.3
200.	3.7	250.	1.3	150.	5.3	173.	8.6	190.	10.0	150.	8.2	250.	8.9	117.	7.4
250.	1.3	300.	.2	200.	4.0	189.	9.8	200.	10.2	192.	9.8	275.	8.8	150.	8.2
300.	.3	350.	-.9	250.	1.5	200.	10.2	240.	8.8	200.	10.1	300.	9.9	208.	10.1
350.	-.4	400.	-1.7	300.	.1	222.	10.3	300.	9.1	230.	8.9	350.	3.4	224.	10.1
400.	-1.8	450.	-2.7	350.	-1.3	244.	8.9	338.	6.9	286.	9.1	400.	.9	232.	8.8
450.	-2.5	500.	-3.1	400.	-2.7	250.	8.9	350.	5.2	288.	5.9	450.	-.4	250.	7.0
500.	-3.3					300.	9.3	400.	2.0	300.	4.9	500.	-1.8	300.	4.0
550.	-3.9					315.	8.8	450.	.8	350.	1.8			350.	1.8
						350.	4.6	500.	-1.7	400.	.2			400.	.2
						400.	1.5	550.	-3.1	450.	-1.4			425.	-.3
						450.	-.3								
						500.	-.9								
						550.	-2.3								
						600.	-3.8								

DATE 710113		DATE 710209		DATE 710311		DATE 710412		DATE 710607		DATE 710816		DATE 711004		DATE 711213	
BRVY	98	BRVY	99	BRVY	100	BRVY	101	BRVY	102	BRVY	103	BRVY	104	BRVY	105
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
0.	10.5	0.	10.4	0.	10.5	0.	10.6	0.	10.4	0.	10.4	0.	10.4	0.	10.6
50.	8.8	50.	8.9	50.	8.8	50.	8.9	50.	8.9	50.	7.9	50.	8.8	50.	8.9
100.	8.0	100.	9.4	88.	9.0	100.	8.4	100.	8.1	100.	8.0	100.	8.0	100.	8.1
120.	7.2	115.	7.3	100.	8.2	125.	7.1	150.	7.8	150.	7.7	150.	7.7	150.	7.7
150.	7.9	150.	9.1	120.	7.2	150.	7.9	200.	9.6	203.	9.6	200.	9.4	200.	9.3
200.	9.9	200.	10.0	150.	8.0	200.	9.8	207.	9.8	219.	6.8	250.	5.6	250.	5.3
228.	9.6	227.	9.8	200.	9.8	210.	9.7	220.	6.5	250.	5.8	300.	3.5	300.	3.0
237.	6.9	232.	8.0	215.	9.9	212.	7.4	250.	5.8	300.	5.9	350.	1.6	350.	1.0
250.	6.0	233.	6.8	233.	5.6	250.	5.0	300.	.1	330.	1.9	400.	.1	400.	.3
300.	3.3	250.	5.2	250.	5.1	300.	1.2	350.	.7	400.	-.9	450.	-1.8	450.	-1.4
350.	1.0	300.	2.8	300.	2.0	350.	.4	400.	-1.6	450.	-1.3	475.	-4.8	475.	-2.0
400.	-.8	350.	.2	350.	.1	400.	-1.1	450.	-2.6						
450.	-1.8	400.	-1.7	400.	-1.4	450.	-2.6	500.	-4.5						
500.	-2.0			450.	-2.3	500.	-3.1								

DATE	720110
SRVY	106
TIME	1200
0.	10.2
50.	8.8
100.	8.0
150.	7.7
200.	9.3
250.	5.3
300.	2.4
350.	.4
400.	-1.0
425.	-1.8

DATE	720214
SRVY	107
TIME	1400
0.	10.8
15.	9.4
50.	8.9
100.	8.0
150.	7.9
180.	8.4
200.	6.4
250.	4.0
300.	2.0
350.	.3
400.	-1.4
450.	-2.4

DATE	720222
SRVY	108
TIME	1200
0.	10.9
10.	9.5
50.	8.7
100.	8.0
150.	7.2
200.	6.3
250.	4.1
300.	1.7
350.	0.0
400.	-1.4

DATE	720317
SRVY	109
TIME	1200
0.	10.6
25.	8.7
50.	8.8
100.	7.9
150.	7.2
186.	6.5
200.	5.5
250.	3.1
300.	1.2
350.	-.3
375.	-1.0

DATE	720410
SRVY	110
TIME	1200
0.	10.8
50.	8.8
100.	8.0
150.	7.3
200.	5.1
250.	3.2
300.	1.4
350.	-.1
387.	-1.6

DATE	720821
SRVY	111
TIME	1400
0.	10.3
25.	8.9
50.	8.7
100.	7.9
150.	7.4
200.	6.2
250.	5.3
267.	4.5
300.	2.3
350.	.4
400.	-.9
450.	-2.1

DATE	721020
SRVY	112
TIME	1000
0.	10.5
50.	8.8
100.	8.2
150.	7.6
200.	6.1
250.	4.4
300.	2.4
350.	.7
400.	-.1
425.	-1.0

DATE	721208
SRVY	113
TIME	1400
0.	10.7
50.	8.6
100.	7.7
150.	6.4
178.	6.7
200.	5.6
250.	2.7
300.	.9
350.	-.6
375.	-1.1

DATE	730105
SRVY	114
TIME	1000
0.	10.7
50.	8.8
100.	8.1
132.	7.9
150.	7.2
200.	5.2
250.	2.6
300.	.8
350.	-.5
375.	-1.4

DATE	730216
SRVY	115
TIME	1000
0.	10.3
50.	8.8
100.	8.0
150.	6.7
200.	4.3
250.	2.2
300.	.6
350.	-.8
400.	-2.4

DATE	730316
SRVY	116
TIME	900
0.	10.4
50.	8.6
100.	7.9
150.	6.6
200.	5.4
225.	3.6
250.	2.1
300.	.3
350.	-1.3
400.	-1.9

DATE	730329
SRVY	117
TIME	800
17.	9.2
50.	8.8
100.	8.2
150.	7.2
200.	5.4
250.	2.8
300.	.9
350.	-.7
400.	-1.6
415.	-2.0

DATE	730405
SRVY	118
TIME	1300
0.	11.0
17.	9.2
50.	8.6
100.	8.0
150.	7.2
161.	7.0
200.	4.5
250.	1.8
300.	.2
350.	-1.3
400.	-2.2

DATE	730418
SRVY	119
TIME	1200
0.	11.1
18.	9.1
50.	8.8
100.	8.1
150.	7.2
164.	7.1
200.	4.7
250.	2.5
300.	.7
350.	-.7
400.	-2.3

DATE 621024		DATE 621101		DATE 621109		DATE 621212		DATE 630109		DATE 630116		DATE 630122		DATE 630130	
SRVY 1		SRVY 2		SRVY 3		SRVY 4		SRVY 5		SRVY 6		SRVY 7		SRVY 8	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
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59.	10.7	71.	10.7	89.	10.0	65.	10.1	-1.	10.8	-1.	10.4	277.	5.7	-1.	10.4
84.	10.5	93.	10.6	124.	10.5	81.	9.6	9.	10.6	24.	9.9	300.	5.1	25.	10.0
137.	9.7	140.	9.6	164.	10.1	172.	6.7	24.	10.0	44.	11.2	306.	3.0	43.	11.1
236.	7.6	205.	9.2	194.	9.0	224.	5.7	44.	11.4	66.	10.5	401.	.9	50.	10.8
290.	6.6	244.	7.5	213.	8.0	276.	5.6	69.	10.9	90.	10.3	435.	.1	73.	10.5
326.	6.3	310.	6.8	270.	7.3	335.	2.2	72.	10.4	109.	10.5	451.	-.7	100.	10.1
374.	2.9	363.	5.2	321.	4.2	406.	.3	99.	10.0	115.	10.4	478.	-1.2	130.	9.2
425.	.2	401.	1.0	364.	2.8	498.	-2.6	109.	10.5	124.	9.9			200.	8.0
581.	-2.2	485.	-1.4	394.	2.1	565.	-2.1	114.	10.5	150.	9.3			229.	7.5
				423.	.3	610.	-3.6	123.	9.6	176.	8.6			275.	6.5
				519.	-.8			150.	9.4	200.	8.2			300.	6.5
								174.	8.9	225.	7.5			325.	3.8
								189.	8.1	252.	6.6			351.	3.0
								225.	7.7	280.	5.5			375.	2.4
								250.	6.7	344.	2.9			425.	.4
								279.	5.0	401.	.1			450.	-.4
								300.	5.0	442.	-.1			501.	-1.0
								350.	2.9	475.	-.3			525.	-1.1
								400.	.9	501.	-.6				
								450.	-.2	525.	-1.2				
								476.	-1.0						
								500.	-1.5						

DATE 630205		DATE 630213		DATE 630221		DATE 630227		DATE 630307		DATE 630313		DATE 630321		DATE 630402	
SRVY 9		SRVY 10		SRVY 11		SRVY 12		SRVY 13		SRVY 14		SRVY 15		SRVY 16	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
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49.	10.8	279.	5.0	-1.	10.6	174.	6.8	25.	10.0	-1.	10.5	99.	10.1	200.	8.1
99.	10.0	300.	4.8	25.	10.0	224.	7.5	40.	11.1	25.	10.1	122.	9.5	225.	7.7
126.	9.2	350.	2.8	50.	10.7	250.	7.0	50.	10.6	56.	10.6	150.	8.2	250.	6.7
151.	9.0	376.	2.1	100.	10.1	275.	6.0	100.	10.0	106.	10.1	200.	6.0	300.	5.8
175.	8.9	400.	1.1	150.	9.3	300.	4.7	130.	9.5	149.	9.8	226.	7.5	350.	3.5
200.	7.0	426.	0.8	200.	8.2	326.	4.3	150.	9.0	173.	8.8	250.	6.5	375.	2.1
250.	6.6	451.	-.8	225.	7.6	350.	2.9	174.	8.8	201.	8.8	275.	5.9	400.	1.1
276.	5.8	477.	-1.1	250.	6.9	375.	1.4	200.	8.2	225.	7.4	301.	5.3	451.	.1
300.	4.8			275.	5.0	400.	.9	225.	7.8	250.	6.6	323.	4.3	500.	-.3
350.	3.1			350.	3.1	425.	.5	250.	6.8	276.	5.0	348.	4.8		
376.	2.0			400.	1.5	451.	-.2	276.	5.0	301.	5.0	376.	2.1		
400.	1.0			450.	-.1	500.	-1.7	301.	4.9	350.	2.8	400.	1.1		
451.	-.3			500.	-1.8			351.	3.1	401.	.8	425.	.5		
525.	-2.2							400.	1.0	451.	-.3	450.	-.4		
576.	-2.8							451.	.5	475.	-1.1				
								477.	-1.1						

DATE	630523
SRVY	17
TIME	1200
----	------
87.	10.1
103.	9.9
150.	9.0
201.	7.9
225.	7.3
251.	6.2
276.	5.9
301.	5.8
325.	5.4
350.	3.7
375.	2.4
400.	1.3
451.	.2
476.	-.2
501.	-.8
526.	-1.5

DATE	630611
SRVY	18
TIME	1200
----	------
-1.	10.5
24.	10.1
50.	10.8
75.	10.4
100.	10.1
150.	9.0
173.	8.5
200.	8.2
225.	7.4
251.	6.7
276.	6.2
300.	5.1
324.	4.1
351.	3.4
375.	2.4
401.	1.6
425.	.9
451.	.4
501.	-1.0

DATE	630626
SRVY	19
TIME	1200
----	------
26.	10.1
50.	10.5
100.	10.1
151.	9.0
201.	8.0
225.	7.0
251.	6.5
301.	4.8
327.	3.9
352.	3.4
375.	1.8
401.	.9
426.	.4
451.	.2
476.	-.5
500.	-1.1

DATE	630712
SRVY	20
TIME	1200
----	------
-1.	10.7
25.	10.2
49.	10.3
100.	10.3
149.	9.1
201.	8.1
225.	6.9
250.	6.5
300.	5.2
325.	4.5
350.	2.8
375.	1.4
400.	.5
450.	-.6

DATE	630724
SRVY	21
TIME	1200
----	------
25.	10.2
49.	10.6
100.	10.5
124.	9.7
150.	9.6
174.	8.5
200.	8.1
226.	7.6
250.	6.8
276.	6.3
300.	5.7
325.	5.3
350.	3.9
400.	1.8
425.	1.2
450.	.8
472.	0.0

DATE	630807
SRVY	22
TIME	1200
----	------
-1.	10.7
25.	10.2
49.	10.4
100.	10.3
124.	9.5
150.	9.0
200.	8.0
226.	7.0
250.	6.5
272.	6.0
301.	5.6
350.	4.2
400.	1.8
424.	1.0
451.	.2
478.	0.0
501.	-.6

DATE	630823
SRVY	23
TIME	1200
----	------
74.	10.8
100.	10.1
150.	9.4
200.	8.3
250.	6.7
276.	6.0
300.	5.8
329.	5.2
351.	4.3
376.	2.6
401.	1.4
424.	.7
451.	.5
501.	-1.1

DATE	630909
SRVY	24
TIME	1200
----	------
175.	8.8
200.	8.4
250.	6.9
274.	6.4
300.	6.1
325.	5.5
350.	3.9
379.	2.5

DATE	630925
SRVY	25
TIME	1200
----	------
50.	10.4
74.	10.8
101.	9.6
126.	9.4
151.	8.7
176.	7.9
226.	6.7
252.	5.9
277.	4.8
303.	4.2
328.	3.9
353.	3.2
377.	2.3
403.	1.7
454.	.8
478.	-.7

DATE	631009
SRVY	26
TIME	1200
----	------
-1.	10.5
25.	10.3
50.	10.4
101.	9.4
126.	9.0
152.	8.4
176.	7.7
201.	6.7
226.	6.2
252.	5.2
302.	4.2
327.	3.8
352.	2.8
377.	1.9
403.	.9
428.	0.0
454.	-.5
479.	-.9

DATE	631028
SRVY	27
TIME	1200
----	------
151.	8.4
201.	7.4
251.	6.2
302.	4.2
353.	2.1
402.	.7
428.	.2
454.	-.5
479.	-.4
529.	-.9

DATE	631114
SRVY	28
TIME	1200
----	------
-1.	10.6
50.	10.4
76.	9.9
102.	9.3
126.	9.0
151.	8.4
201.	6.7
252.	4.8
278.	4.3
302.	3.1
328.	1.8
353.	1.0
403.	0.0
429.	-.7
453.	-1.0

DATE	631231
SRVY	29
TIME	1200
----	------
-1.	10.6
25.	10.1
50.	10.6
76.	10.1
101.	10.0
126.	9.1
151.	8.6
201.	8.3
227.	7.4
252.	6.4
277.	5.9
302.	5.2
353.	4.4
403.	3.2
453.	1.5
504.	.3
554.	-.7
605.	-1.7
655.	-2.7
680.	-3.1

DATE	640117
SRVY	30
TIME	1200
----	------
-1.	10.6
27.	10.1
50.	10.3
100.	10.1
151.	9.1
202.	8.0
252.	6.7
302.	5.2
353.	3.8
403.	2.7
454.	1.7
504.	.7
540.	0.0

DATE	640214
SRVY	31
TIME	1200
----	------
-1.	10.6
50.	10.6
100.	10.0
151.	9.3
201.	8.2
251.	6.9
302.	5.5
353.	4.7
403.	3.4
453.	1.9
503.	.6
539.	0.0

DATE	640312
SRVY	32
TIME	1200
----	------
0.	10.7
50.	10.8
101.	10.2
151.	9.2
201.	8.0
228.	7.4
252.	6.6
302.	5.9
353.	4.9
403.	4.0
454.	1.8
504.	.2
554.	-1.1
580.	-1.8

DATE 680409		DATE 680527		DATE 680628		DATE 680831		DATE 680925		DATE 681203		DATE 690120		DATE 690428	
SRVY 33		SRVY 34		SRVY 35		SRVY 36		SRVY 37		SRVY 38		SRVY 39		SRVY 40	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------
50.	10.8	-1.	10.9	0.	10.8	0.	10.4	50.	10.2	0.	10.4	50.	10.1	0.	10.8
100.	10.0	50.	10.5	50.	10.8	50.	10.5	101.	9.9	50.	10.4	100.	9.9	50.	10.5
151.	9.0	101.	10.4	100.	10.2	101.	9.3	152.	9.0	101.	10.0	151.	8.9	100.	10.1
201.	7.9	151.	9.1	151.	9.1	151.	9.1	202.	8.6	151.	9.4	201.	8.7	151.	9.6
252.	7.0	201.	8.6	201.	8.4	201.	8.3	252.	6.9	202.	8.8	252.	7.4	201.	8.9
302.	5.9	252.	7.6	252.	7.0	252.	7.1	302.	5.0	252.	7.0	302.	5.7	251.	7.3
353.	4.7	302.	6.0	302.	6.0	302.	6.1	352.	3.3	302.	5.7	352.	4.0	303.	6.1
403.	3.6	352.	5.4	352.	5.8	352.	6.0	403.	1.9	352.	4.3	404.	2.9	352.	5.4
454.	1.7	403.	4.6	403.	5.0	403.	4.9	453.	.7	403.	2.6	453.	1.8	403.	2.9
504.	0.0	453.	2.7	453.	2.4	453.	1.6	503.	.1	453.	.6	504.	.6	453.	.8
555.	-1.1	504.	.2	504.	.1	503.	.1			503.	-.5	554.	-.8	504.	-.5
604.	-2.5	553.	-1.6	554.	-1.1	554.	-1.5			553.	-2.2	605.	-2.0	554.	-2.3
655.	-3.7	604.	-2.8	604.	-2.5	604.	-2.8			574.	-3.0			604.	-2.6

DATE 650908		DATE 651029		DATE 651220		DATE 660124		DATE 660329		DATE 660426		DATE 661103		DATE 670118	
SRVY 41		SRVY 42		SRVY 43		SRVY 44		SRVY 45		SRVY 46		SRVY 47		SRVY 48	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------
50.	10.3	99.	9.9	0.	10.3	0.	9.7	0.	9.7	0.	9.7	50.	10.3	0.	10.6
101.	10.0	150.	9.1	50.	10.1	50.	10.3	50.	10.3	50.	10.7	100.	10.3	50.	10.3
151.	9.6	200.	8.6	101.	9.8	100.	10.0	100.	10.0	101.	10.3	150.	9.7	100.	10.3
201.	8.5	251.	7.1	151.	9.1	151.	9.4	151.	9.4	151.	9.4	201.	8.8	151.	9.8
251.	7.3	301.	6.2	200.	7.3	201.	9.6	201.	9.4	201.	9.5	277.	7.3	251.	7.9
303.	6.0	319.	6.8	250.	8.5	251.	7.0	251.	7.4	251.	7.5	302.	6.3	302.	5.8
352.	6.0	358.	3.6	264.	6.4	302.	4.0	301.	5.5	302.	5.8	330.	4.9	352.	4.3
378.	5.7	402.	.8	301.	4.3	352.	3.4	352.	4.7	352.	4.4	402.	1.7	402.	2.6
403.	2.5	453.	0.0	351.	1.9	402.	1.7	376.	3.4	402.	2.4	452.	.5	503.	-.8
453.	0.0	502.	-1.0	402.	.2	452.	.4	402.	2.0	452.	.7	503.	-1.0	553.	-1.7
504.	-1.8	553.	-2.0	452.	-.7	503.	-.4	427.	1.0	502.	-.2	528.	-1.6		
554.	-2.9			503.	-2.4	553.	-1.4	476.	-.1						
				553.	-2.6	603.	-2.0	503.	-1.0						
								528.	-1.6						
								553.	-2.2						

DATE	670503
SRVY	49
TIME	1200
----	------
0.	10.0
50.	10.5
151.	9.6
201.	8.8
251.	7.9
301.	6.6
352.	5.0
3A2.	4.5
40E.	3.4
452.	1.5
503.	-.8
554.	-.9
603.	-1.7
629.	-2.7

DATE	670919
SRVY	50
TIME	1200
----	------
50.	9.4
150.	8.8
200.	7.9
250.	6.8
300.	6.2
350.	3.7
400.	2.2
450.	-.5
500.	-1.8

DATE	670919
SRVY	51
TIME	1200
----	------
0.	11.4
50.	10.4
100.	11.0
150.	9.8
200.	9.2
250.	8.0
300.	7.4
401.	2.2
451.	-.4
500.	-1.5

DATE	671213
SRVY	52
TIME	1200
----	------
0.	10.5
50.	10.5
100.	10.1
150.	9.8
200.	8.7
250.	7.9
292.	7.1
351.	5.6
401.	1.5
450.	0.0
500.	-1.4
550.	-2.0

DATE	680115
SRVY	53
TIME	1200
----	------
-1.	10.8
50.	11.2
100.	10.1
150.	9.6
200.	8.7
238.	8.3
250.	7.0
350.	3.1
400.	1.6
450.	0.0
499.	-1.1
549.	-1.9
600.	-2.1

DATE	680124
SRVY	54
TIME	1200
----	------
0.	10.8
50.	10.7
100.	10.3
150.	9.4
200.	8.8
246.	8.4
301.	4.9
350.	4.1
401.	1.2
449.	.7
500.	-.7
550.	-.9

DATE	680130
SRVY	55
TIME	1200
----	------
-1.	10.8
50.	10.7
100.	10.2
149.	9.7
200.	8.8
250.	7.5
301.	5.7
350.	3.4
400.	1.6
450.	.1
499.	-1.7
550.	-2.7

DATE	680208
SRVY	56
TIME	1200
----	------
0.	10.8
49.	10.7
99.	10.2
149.	9.5
200.	8.4
250.	7.9
300.	5.2
350.	2.9
401.	1.0
450.	0.0

DATE	680215
SRVY	57
TIME	1200
----	------
-1.	10.8
49.	10.8
100.	10.1
149.	9.4
200.	8.4
250.	7.8
300.	5.2
350.	3.2
400.	1.1
450.	-.1
500.	-1.2
550.	-2.5
600.	-3.1

DATE	680221
SRVY	58
TIME	1200
----	------
-1.	10.8
50.	10.6
100.	10.1
150.	9.4
200.	8.6
249.	7.2
300.	5.5
351.	3.9
400.	1.2
450.	.1
500.	-1.1
585.	-2.0

DATE	680226
SRVY	59
TIME	1200
----	------
0.	10.8
50.	10.6
100.	10.1
149.	9.3
200.	8.6
250.	7.7
300.	5.8
350.	3.0
400.	.9
450.	-.5
499.	-1.4
550.	-2.9

DATE	680307
SRVY	60
TIME	1200
----	------
0.	10.9
49.	10.9
100.	10.1
150.	9.5
200.	8.7
250.	7.7
300.	5.1
350.	3.5
400.	1.1
450.	-.2
500.	-1.2

DATE	680313
SRVY	61
TIME	1200
----	------
-1.	10.9
50.	10.9
100.	10.1
200.	8.5
250.	7.5
300.	5.0
350.	2.9
400.	.9
450.	-.5
500.	-1.9
550.	-3.0

DATE	680322
SRVY	62
TIME	1200
----	------
-1.	10.8
100.	10.1
150.	9.5
200.	8.7
250.	8.0
300.	5.4
331.	4.3
350.	3.1
401.	1.0
449.	.1
500.	-2.6
524.	-2.9

DATE	681007
SRVY	63
TIME	1200
----	------
50.	10.6
100.	10.3
150.	9.5
200.	8.8
250.	7.8
300.	6.5
325.	6.4
350.	4.1
400.	1.3
450.	1.1
500.	-1.7
550.	-3.1

DATE	681025
SRVY	64
TIME	1200
----	------
0.	10.5
50.	10.4
100.	10.2
150.	9.3
200.	8.5
250.	7.5
300.	6.7
350.	3.3
400.	1.2
480.	-.4
475.	-1.1

DATE 681115	
SRVY 65	
TIME 1200	
0.	10.7
50.	10.4
100.	10.1
150.	9.5
200.	9.0
250.	7.2
300.	4.7
350.	2.7
400.	1.3
450.	-.1
500.	-.8
550.	-1.9
600.	-3.2

DATE 681220	
SRVY 66	
TIME 1200	
0.	10.3
50.	10.1
100.	10.0
150.	9.4
200.	8.9
250.	7.5
300.	5.4
350.	3.7
400.	1.9
450.	.0
500.	-1.7
550.	-2.7

DATE 690113	
SRVY 67	
TIME 1200	
0.	10.6
50.	10.4
100.	10.0
150.	9.4
200.	8.9
250.	7.4
300.	5.2
350.	3.4
375.	2.2
400.	1.3
450.	-.3
500.	-1.6
550.	-2.7
600.	-3.4

DATE 690122	
SRVY 68	
TIME 1200	
0.	10.7
50.	10.5
100.	10.0
150.	9.3
200.	8.9
250.	7.2
300.	4.5
350.	2.6
400.	.9
450.	-.3
500.	-1.5
585.	-1.8

DATE 690129	
SRVY 69	
TIME 1200	
0.	10.7
50.	10.4
100.	10.0
150.	9.3
200.	8.9
250.	7.4
300.	4.7
350.	2.8
400.	.8
450.	-.1
500.	-1.4
550.	-2.1
600.	-3.1

DATE 690205	
SRVY 70	
TIME 1200	
0.	10.7
50.	10.4
100.	10.1
150.	9.4
200.	8.9
250.	7.3
300.	4.9
339.	3.3
350.	2.7
400.	1.2
450.	0.0
500.	-1.1
550.	-2.5
600.	-3.6
625.	-4.3

DATE 690212	
SRVY 71	
TIME 1200	
0.	10.7
50.	10.5
100.	10.1
150.	9.5
200.	8.9
250.	7.4
300.	5.1
335.	3.9
350.	3.3
400.	1.2
450.	0.0
500.	-1.2
550.	-2.2
575.	-2.7

DATE 690219	
SRVY 72	
TIME 1200	
0.	10.7
50.	10.6
100.	10.1
150.	9.6
200.	9.1
250.	7.6
285.	5.9
300.	5.1
350.	3.0
400.	1.5
450.	.1
500.	-1.1
550.	-2.2

DATE 690226	
SRVY 73	
TIME 1200	
0.	10.7
50.	10.6
100.	9.9
150.	9.5
200.	9.0
250.	7.5
300.	3.5
320.	4.7
350.	3.5
400.	1.3
450.	-.2
500.	-1.1
550.	-1.7

DATE 690305	
SRVY 74	
TIME 1200	
0.	10.7
50.	10.7
100.	10.0
150.	9.6
200.	8.9
250.	7.9
300.	5.9
325.	5.1
350.	4.2
400.	2.7
450.	.7
500.	-1.0
550.	-2.1
600.	-1.7
650.	-3.2
700.	-4.3

DATE 690312	
SRVY 75	
TIME 1200	
0.	10.7
50.	10.6
100.	9.9
150.	9.3
200.	8.9
250.	7.5
300.	5.5
350.	4.2
400.	1.8
450.	-.3
500.	-1.7
550.	-2.6

DATE 690319	
SRVY 76	
TIME 1200	
0.	10.6
50.	10.7
100.	9.9
150.	9.4
200.	9.1
250.	7.8
300.	5.9
330.	5.4
350.	4.3
400.	1.7
450.	.2
500.	-1.4
550.	-2.5

DATE 690327	
SRVY 77	
TIME 1200	
50.	10.3
100.	11.1
150.	9.2
200.	8.9
250.	8.3
300.	6.9
350.	5.4
400.	2.5
450.	-.3
500.	-1.0
550.	-2.1

DATE 690923	
SRVY 78	
TIME 1200	
0.	10.7
50.	10.4
100.	10.2
150.	9.4
200.	8.9
250.	8.1
300.	6.6
350.	3.8
400.	1.4
450.	-.3
500.	-2.0

DATE 691023	
SRVY 79	
TIME 1200	
50.	10.7
100.	10.2
150.	9.2
200.	8.8
250.	7.8
274.	7.3
298.	4.6
350.	1.9
400.	.3
450.	-1.1
500.	-2.1
550.	-3.2
600.	-3.6
625.	-4.8

DATE 691120	
SRVY 80	
TIME 1200	
50.	10.7
100.	10.2
150.	9.3
200.	8.9
228.	8.6
250.	7.5
300.	4.9
350.	2.1
400.	.3
450.	-1.0
490.	-1.9
490.	-2.3
500.	-2.3
550.	-3.4

DATE 691216 SRVY A1 TIME 1200		DATE 700110 SRVY A2 TIME 1200		DATE 700121 SRVY A3 TIME 1200		DATE 700128 SRVY A4 TIME 1200		DATE 700204 SRVY A5 TIME 1200		DATE 700211 SRVY A6 TIME 1200		DATE 700218 SRVY A7 TIME 1200		DATE 700225 SRVY A8 TIME 1200	
[illegible]	10.5	50.	10.6	50.	10.4	50.	10.3	50.	10.3	50.	10.2	0.	11.7	50.	10.3
[illegible]	10.3	100.	10.4	100.	10.5	100.	10.4	100.	10.4	100.	10.4	50.	10.2	100.	10.2
[illegible]	9.4	150.	9.5	150.	9.6	150.	9.4	150.	9.5	150.	9.5	100.	10.5	150.	9.3
[illegible]	9.1	200.	9.0	200.	9.2	200.	9.0	200.	9.1	200.	9.1	150.	9.2	200.	9.0
[illegible]	8.8	220.	8.9	226.	8.9	217.	9.0	221.	9.0	221.	9.0	200.	9.0	224.	9.0
[illegible]	6.0	250.	6.7	240.	7.1	250.	6.8	250.	6.6	250.	6.7	235.	8.7	250.	6.9
[illegible]	4.2	298.	4.3	300.	4.6	300.	4.3	300.	3.4	300.	3.6	250.	7.5	300.	4.0
[illegible]	1.9	350.	1.9	350.	2.1	350.	2.0	350.	1.4	350.	1.5	275.	5.5	350.	2.5
[illegible]	.5	400.	.3	400.	.7	400.	.6	400.	-.1	400.	-.2	300.	4.3	400.	.9
[illegible]	-.8	450.	-1.0	450.	-.9	450.	-1.2	450.	-1.4	450.	-1.3	350.	2.3	450.	-.3
[illegible]	-1.6	500.	-2.1	500.	-1.8	500.	-2.3	500.	-2.9	500.	-2.1	400.	.4	500.	-2.0
[illegible]	-2.2	550.	-3.3	546.	-2.9	550.	-3.0					450.	-.5	550.	-2.5
[illegible]	-3.8											500.	-1.0		
												550.	-2.4		

DATE 700304 SRVY A9 TIME 1200		DATE 700311 SRVY A0 TIME 1200		DATE 700318 SRVY A1 TIME 1200		DATE 700518 SRVY A2 TIME 1200		DATE 700826 SRVY A3 TIME 1200		DATE 701015 SRVY A4 TIME 1200		DATE 701106 SRVY A5 TIME 1200		DATE 701209 SRVY A6 TIME 1200	
0.	10.7	50.	10.4	0.	10.7	0.	10.7	0.	10.7	50.	10.1	0.	10.7	0.	10.6
50.	10.6	100.	10.3	50.	10.4	50.	10.3	50.	10.1	100.	10.0	50.	10.6	50.	10.6
100.	10.3	150.	9.3	100.	10.3	100.	12.2	100.	10.1	150.	9.3	100.	10.3	100.	10.1
150.	9.5	200.	9.0	150.	9.3	150.	7.4	150.	9.2	200.	9.0	150.	9.5	150.	9.2
200.	9.1	226.	8.7	200.	9.0	200.	8.9	200.	8.9	250.	7.4	200.	9.0	200.	8.9
220.	8.8	250.	6.6	226.	8.7	225.	8.7	250.	9.4	300.	8.6	250.	7.9	250.	7.8
250.	6.6	278.	5.9	250.	6.5	250.	6.6	300.	8.6	326.	8.0	300.	8.4	300.	8.6
300.	4.2	300.	4.7	300.	4.7	300.	4.5	313.	8.4	330.	6.2	318.	8.6	330.	9.0
350.	2.2	350.	2.3	350.	2.3	350.	1.9	350.	5.9	400.	2.0	350.	5.6	400.	2.0
400.	.6	400.	.6	400.	.6	395.	.3	400.	2.7	450.	.6	400.	3.3	450.	.4
450.	-1.2	450.	-.8	450.	-.7	400.	-.1	450.	.2	500.	-1.3	450.	1.8	500.	-1.9
500.	-1.8	500.	-1.9	500.	-1.8	450.	-1.9	485.	-1.1	550.	-3.0	500.	-.8		
		550.	-3.0	550.	-3.0	460.	-2.7	500.	-1.0	600.	-4.2	545.	-2.0		
		600.	-4.4					550.	-2.5						
								600.	-4.7						

DATE 701218		DATE 710113		DATE 710209		DATE 710311		DATE 710412		DATE 710607		DATE 710816		DATE 711008	
SRVY	97	SRVY	98	SRVY	99	SRVY	100	SRVY	101	SRVY	102	SRVY	103	SRVY	104
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
0.	10.7	[illegible]	[illegible]	50.	10.7	50.	10.5	0.	10.7	50.	10.0	50.	10.1	50.	10.3
50.	10.7	[illegible]	[illegible]	100.	10.1	100.	10.0	50.	10.1	100.	10.2	100.	10.1	100.	10.2
100.	10.6	[illegible]	[illegible]	150.	9.3	150.	9.2	100.	10.5	150.	9.4	150.	9.2	150.	9.3
150.	9.4	[illegible]	[illegible]	200.	8.9	200.	8.9	150.	9.2	200.	8.8	200.	8.8	200.	8.9
200.	9.1	[illegible]	[illegible]	250.	8.0	250.	8.0	200.	8.8	250.	8.3	250.	8.1	250.	8.6
250.	8.3	[illegible]	[illegible]	300.	8.4	300.	8.3	250.	8.2	300.	7.0	300.	7.2	270.	8.2
300.	8.4	[illegible]	[illegible]	350.	4.3	307.	8.1	285.	8.2	350.	5.6	350.	6.4	300.	5.5
309.	8.5	[illegible]	[illegible]	400.	1.6	334.	5.3	300.	7.2	384.	4.4	400.	1.7	350.	3.4
350.	4.9	[illegible]	[illegible]	450.	-.1	350.	4.3	350.	4.2	400.	2.4	450.	-.8	400.	1.6
400.	2.2	[illegible]	[illegible]	500.	-1.1	400.	2.0	400.	3.7	450.	-.7	500.	-2.3	450.	-.5
450.	.9	[illegible]	[illegible]	550.	-2.5	450.	.4	430.	-2.0	500.	-2.8			500.	-.8
500.	-.6	[illegible]	[illegible]			500.	-1.2	450.	-2.6	550.	-2.8			550.	-2.0
		[illegible]	[illegible]			550.	-2.2			600.	-3.4				

DATE 711213		DATE 720110		DATE 720214		DATE 720222		DATE 720410		DATE 720821		DATE 721020		DATE 721208	
SRVY	105	SRVY	106	SRVY	107	SRVY	108	SRVY	110	SRVY	111	SRVY	112	SRVY	113
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1400	TIME	1000	TIME	1400
50.	10.7	[illegible]	10.5	50.	10.5	50.	10.4	50.	10.6	50.	10.4	50.	10.5	50.	10.6
100.	10.2	[illegible]	10.2	100.	10.6	100.	10.1	100.	10.1	100.	10.4	100.	10.7	92.	10.7
150.	9.1	[illegible]	9.2	150.	9.2	150.	9.0	150.	9.1	150.	9.1	150.	9.2	100.	10.4
200.	8.7	[illegible]	8.9	200.	9.0	200.	8.8	200.	9.0	200.	8.7	200.	8.9	150.	9.0
250.	8.6	[illegible]	8.5	250.	8.3	227.	8.5	220.	8.8	250.	7.6	250.	7.5	200.	8.8
263.	8.2	[illegible]	8.0	300.	4.8	250.	6.9	250.	6.4	300.	7.1	300.	5.2	250.	7.3
300.	6.7	[illegible]	3.1	350.	2.4	300.	4.4	300.	4.8	310.	6.6	350.	3.2	300.	4.2
350.	3.4	[illegible]	.7	400.	.7	330.	2.5	331.	3.5	350.	2.6	400.	1.4	350.	1.8
400.	1.0	[illegible]	-.8	450.	-.8	400.	1.1	355.	3.9	400.	.1	450.	-.8	400.	0.0
450.	-1.2	[illegible]	-1.9	500.	-2.2	450.	-.1	400.	.2	450.	-1.0	475.	-1.6	450.	-1.0
500.	-2.5					500.	-1.4	430.	-2.0	500.	-2.2			475.	-2.3

DATE 730105		DATE 730216		DATE 730316		DATE 730325		DATE 730405		DATE 730418	
SRVY 114		SRVY 115		SRVY 116		SRVY 117		SRVY 118		SRVY 119	
TIME 1100		TIME 1000		TIME 900		TIME 800		TIME 1300		TIME 1200	
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50.	10.9	50.	10.7	50.	10.8	50.	10.7	50.	10.6	50.	10.7
100.	10.4	100.	10.4	100.	10.3	100.	10.4	100.	10.4	100.	10.2
150.	9.0	150.	9.0	150.	9.0	150.	9.0	150.	8.9	150.	9.2
200.	8.9	200.	8.9	200.	8.9	200.	8.9	200.	8.9	200.	8.8
230.	8.6	223.	8.7	224.	8.6	236.	8.8	230.	8.7	250.	7.7
250.	7.3	250.	6.8	250.	6.9	250.	7.6	250.	7.6	300.	4.7
300.	4.6	300.	3.8	300.	4.9	300.	4.0	300.	4.4	344.	4.2
350.	2.2	350.	1.8	350.	2.3	350.	1.0	350.	2.1	350.	3.6
400.	.5	400.	.2	400.	0.0	400.	1.1	400.	.5	400.	.5
450.	-1.2	450.	-1.0	440.	-1.5	450.	-.4	450.	-1.8	450.	-1.8
		495.	-2.9	475.	-2.0	500.	-2.2	500.	-3.0	475.	-3.3

DATE 621024		DATE 621101		DATE 621109		DATE 621212		DATE 630109		DATE 630116		DATE 630122		DATE 630130	
SRVY 1		SRVY 2		SRVY 3		SRVY 4		SRVY 5		SRVY 6		SRVY 7		SRVY 8	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
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102.	9.0	-1.	10.7	134.	8.0	33.	10.4	-1.	10.5	49.	10.1	50.	10.1	0.	10.5
161.	7.4	18.	10.3	227.	7.6	82.	9.3	24.	10.2	100.	8.9	100.	9.1	50.	10.1
221.	6.1	41.	10.7	277.	6.4	131.	8.1	50.	10.1	150.	7.7	150.	7.7	100.	8.8
246.	5.8	69.	9.8	318.	4.6	188.	7.0	100.	8.9	200.	7.0	200.	7.0	124.	8.0
340.	6.1	118.	8.5	418.	.3	236.	6.6	124.	8.0	225.	6.9	225.	6.8	150.	7.8
385.	1.7	221.	6.1	482.	-1.9	302.	4.5	150.	7.8	250.	6.0	251.	6.1	200.	6.9
435.	-.1	241.	5.9	539.	-2.5	359.	2.0	176.	7.0	265.	6.0	266.	6.0	225.	6.8
484.	-2.0	339.	6.1			433.	.8	201.	6.8	300.	3.9	300.	4.0	275.	5.3
		342.	5.2			515.	-3.1	225.	6.7	325.	2.9	328.	2.8	300.	4.3
		370.	1.6			587.	-2.1	261.	5.8	351.	2.2	350.	1.4	350.	2.9
		438.	-1.1			618.	-2.4	300.	3.2	378.	1.7	376.	1.5	400.	1.8
		486.	-1.9			674.	-3.7	326.	2.1	450.	.2	401.	1.3	425.	.8
								378.	1.5	482.	0.0	431.	.7	450.	.4
								401.	1.0	501.	-.4	450.	.2	500.	-.1
								426.	.9	526.	-1.8	501.	0.0	586.	-1.1
								451.	.4			525.	-.5		
								480.	0.0			551.	-1.8		
								500.	-.5						
								526.	-1.8						

DATE	630205
SRVY	9
TIME	1800
----	------
230.	5.9
275.	3.8
301.	2.6
325.	1.3
400.	.5
451.	-.9

DATE	630213
SRVY	10
TIME	1800
----	------
141.	8.0
150.	6.8
176.	5.8
200.	5.8
227.	5.8
255.	5.1
277.	4.2
300.	3.7
351.	1.9
375.	.7
401.	.7
431.	-.7
451.	-.7

DATE	630221
SRVY	11
TIME	1200
----	------
-1.	8.6
20.	7.3
50.	7.0
99.	6.8
123.	7.4
131.	8.4
142.	8.0
150.	6.8
174.	5.8
201.	5.8
226.	5.8
253.	5.1
277.	3.9
301.	3.4
325.	2.5
350.	1.9
379.	1.2
399.	.3
425.	-.2
450.	-.6
476.	-1.6

DATE	630227
SRVY	12
TIME	1200
----	------
20.	7.3
75.	6.8
116.	6.9
121.	7.8
135.	7.9
174.	5.8
200.	5.8
226.	5.9
250.	5.1
275.	4.0
300.	3.7
351.	1.5
400.	.3
450.	-.9
476.	-1.4

DATE	630307
SRVY	13
TIME	1200
----	------
205.	5.8
225.	5.8
251.	5.1
277.	4.0
300.	3.2
325.	2.0
350.	1.2
401.	0.0
450.	-1.2

DATE	630313
SRVY	14
TIME	1200
----	------
0.	8.6
20.	7.2
50.	6.8
100.	6.6
150.	6.8
175.	5.8
200.	5.6
225.	5.8
250.	5.1
275.	4.3
300.	3.1
326.	1.9
350.	1.3
400.	-.2
451.	-1.2

DATE	630321
SRVY	15
TIME	1800
----	------
176.	5.8
225.	5.8
250.	5.3
274.	4.5
301.	3.2
326.	1.9
351.	1.2
400.	0.0
424.	-.4
450.	-.8

DATE	630402
SRVY	16
TIME	1200
----	------
0.	8.0
6.	8.5
10.	7.9
17.	7.7
50.	6.8
100.	6.6
125.	7.5
150.	7.0
175.	5.9
226.	5.8
250.	5.6
275.	4.8
301.	3.5
351.	1.4
401.	.5
426.	0.0
451.	-.5
475.	-1.2

DATE	630523
SRVY	17
TIME	1200
----	------
-1.	8.8
20.	7.3
50.	6.6
101.	6.7
126.	7.0
151.	6.7
174.	5.7
225.	5.9
254.	5.3
300.	3.4
324.	3.4
350.	1.8
374.	.9
401.	.3
450.	-.9

DATE	630611
SRVY	18
TIME	1800
----	------
0.	8.8
20.	7.4
25.	8.0
49.	6.8
100.	6.8
111.	6.8
119.	8.1
125.	7.1
150.	6.6
175.	5.9
201.	5.9
251.	5.4
276.	5.4
300.	3.9
324.	2.3
401.	.6
451.	-.7

DATE	630626
SRVY	19
TIME	1200
----	------
110.	6.6
120.	7.6
150.	7.1
174.	6.0
200.	5.6
225.	5.8
251.	5.8
276.	5.5
300.	5.0
351.	2.3
376.	1.6
426.	.8
451.	-.6

DATE	630712
SRVY	20
TIME	1200
----	------
-1.	9.0
25.	8.4
50.	6.8
101.	6.7
126.	7.5
153.	6.9
174.	5.8
201.	5.9
227.	5.8
250.	5.5
275.	5.5
301.	4.7
327.	2.8
350.	1.5
375.	.3
401.	-.2
426.	-.9

DATE	630726
SRVY	21
TIME	1800
----	------
-1.	8.9
24.	7.6
50.	6.9
73.	6.5
100.	6.6
125.	7.8
151.	7.3
176.	5.8
201.	5.5
225.	5.8
251.	5.7
274.	5.7
301.	5.9
325.	3.8
351.	2.4
376.	1.4
401.	1.0
425.	.9
450.	-.1
476.	-.5

DATE	630807
SRVY	22
TIME	1800
----	------
0.	9.0
25.	7.5
50.	7.0
75.	6.6
100.	6.6
124.	7.3
151.	6.8
175.	5.8
200.	5.5
226.	5.9
250.	5.8
276.	5.8
300.	6.0
326.	5.0
351.	3.4
375.	1.9
425.	.8
476.	-.5

DATE	630823
SRVY	23
TIME	1800
----	------
0.	9.0
49.	7.0
76.	6.6
100.	6.8
125.	7.3
150.	7.2
175.	6.1
201.	5.7
223.	5.9
250.	5.5
276.	5.9
302.	5.5
350.	2.0
376.	.8
426.	.1
476.	-.7

DATE	630905
SRVY	24
TIME	1200
----	------
126.	7.3
151.	7.3
174.	6.0
201.	5.7
224.	5.9
251.	5.6
278.	5.8
300.	4.8
326.	3.2

DATE 630929			DATE 631009			DATE 631028			DATE 631114			DATE 640117			DATE 640214			DATE 640312			DATE 640409		
BRVY 25			BRVY 26			BRVY 27			BRVY 28			BRVY 30			BRVY 31			BRVY 32			BRVY 33		
TIME 1200			TIME 1200			TIME 1200			TIME 1200			TIME 1200			TIME 1200			TIME 1200			TIME 1200		
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25.	7.8		*101.	8.3		201.	8.4		*100.	8.2		0.	7.9		0.	8.0		0.	8.4		0.	8.1	
50.	8.7		*77.	8.2		227.	8.3		*74.	8.2		26.	7.9		25.	8.1		24.	8.0		51.	7.3	
75.	8.5		*51.	8.6		252.	9.0		*51.	8.6		51.	7.5		50.	7.5		51.	8.0		77.	7.0	
100.	8.7		0.	8.9		276.	9.5		0.	8.8		77.	8.2		76.	8.0		74.	8.3		102.	7.2	
126.	7.3		25.	8.5		302.	8.5		50.	7.9		102.	8.3		101.	8.1		101.	8.1		126.	7.2	
151.	8.8		50.	8.5		327.	1.4		77.	8.5		152.	8.0		152.	8.6		127.	8.9		151.	6.7	
176.	5.8		76.	8.5		377.	.4		101.	8.6		178.	6.4		178.	8.3		151.	8.7		201.	6.2	
201.	5.6		100.	8.9		402.	*.8		126.	7.0		202.	5.8		202.	5.5		176.	8.6		302.	3.0	
227.	5.8		126.	7.5		428.	*.9		176.	6.2		226.	4.8		227.	5.2		201.	8.0		353.	3.5	
277.	3.5		151.	6.8					227.	4.5		252.	4.0		253.	4.6		226.	8.0		403.	.6	
302.	3.4		177.	5.4					251.	4.5		279.	2.9		303.	2.5		328.	1.9		454.	*1.0	
327.	3.0		202.	6.0					277.	4.0		303.	2.4		353.	1.3		354.	.8		504.	*.5	
378.	.8		251.	6.1					302.	1.9		337.	1.5		378.	.9		378.	0.0		555.	*.7	
403.	*.3		276.	6.4					327.	1.2		353.	1.1		404.	*1.5		404.	*1.6				
429.	*1.0		302.	6.9					353.	*.5		382.	1.1		429.	*1.7		430.	*1.7				
			327.	2.5					378.	*1.4		403.	*.8		455.	*1.6		456.	*1.3				
			353.	*.4								429.	*1.0		505.	*1.2		480.	*1.8				
			377.	*.6								455.	*2.1		555.	*3.0		505.	*1.9				
			403.	*.0								480.						555.	*3.0				
			428.	*.0								505.											
			453.	*.1								555.											
			480.	*.6																			
			504.	*1.0																			

DATE 640507			DATE 640524			DATE 640611			DATE 640625			DATE 640723			DATE 640820			DATE 640908		
BRVY 34			BRVY 35			BRVY 36			BRVY 37			BRVY 38			BRVY 39			BRVY 40		
TIME 1200			TIME 1200			TIME 1200			TIME 1200			TIME 1200			TIME 1200			TIME 1200		
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0.	8.8		0.	7.9		0.	7.3		0.	7.9		-1.	8.0		0.	7.9		-50.	8.0	
50.	8.4		50.	7.3		50.	8.4		50.	7.2		50.	7.3		50.	7.4		0.	8.0	
100.	8.7		100.	8.2		100.	9.6		101.	7.0		101.	7.1		100.	7.1		52.	7.4	
151.	8.9		151.	8.8		151.	8.1		151.	6.7		151.	6.7		150.	7.0		101.	7.6	
201.	8.3		201.	8.2		201.	5.7		201.	5.6		202.	5.7		201.	5.9		152.	7.4	
252.	5.6		252.	5.7		252.	5.0		252.	4.6		251.	4.5		251.	5.9		202.	6.0	
302.	4.0		277.	5.0		302.	5.3		302.	3.7		302.	3.6		302.	2.7		252.	5.4	
327.	4.3		302.	4.8		353.	4.0		353.	1.8		352.	1.6		352.	1.4		302.	4.4	
352.	2.7		352.	2.5		403.	2.9		403.	.5		402.	.8		402.	.7		352.	3.0	
403.	.7		403.	.1		453.	.1		453.	0.0		453.	0.0		453.	*1.6		401.	1.0	
453.	*1.0		426.	*1.6		493.	*1.3		504.	*1.3		504.	*1.3		504.	*2.5		453.	*.5	
504.	*3.1		454.	*1.5		503.	*3.4		554.	*1.6		555.	*1.6		555.	*3.2		504.	*2.0	
			476.	*1.5					603.	*1.8		604.	*2.5		604.	*3.8		554.	*1.0	
			504.	*1.5					655.	*2.0		655.	*3.8					604.	*3.0	
			529.	*1.8																
			605.	*2.0																

DATE	651020
SRVY	42
TIME	1200
----	------
-51.	8.7
0.	8.3
50.	7.6
101.	7.4
151.	6.9
202.	6.2
252.	5.7
302.	6.4
328.	4.1
352.	2.6
403.	1.4
428.	.9
453.	-.1
478.	-.5
503.	-1.4

DATE	651220
SRVY	43
TIME	1200
----	------
-51.	8.7
0.	8.0
50.	7.1
101.	7.3
151.	6.9
201.	6.0
251.	5.7
290.	6.1
302.	5.8
352.	4.0
404.	2.9
454.	.6
504.	-1.6
554.	-3.1

DATE	660124
SRVY	44
TIME	1200
----	------
50.	7.3
100.	7.2
150.	7.0
201.	6.3
251.	5.3
352.	3.0
402.	2.0
452.	1.4
553.	-.8
603.	-2.1

DATE	660329
SRVY	45
TIME	1200
----	------
0.	8.2
50.	7.5
100.	7.0
150.	6.9
201.	6.6
251.	5.9
301.	4.5
339.	4.2
377.	2.3
402.	.8
427.	.4
452.	.6
502.	-1.0
528.	-1.9

DATE	660426
SRVY	46
TIME	1200
----	------
0.	8.8
51.	7.8
100.	7.0
151.	7.2
201.	6.6
251.	5.9
302.	5.2
352.	5.0
383.	5.2
402.	3.0
452.	.7
503.	-.5

DATE	661103
SRVY	47
TIME	1200
----	------
0.	7.9
50.	7.5
101.	6.9
150.	6.9
201.	6.7
252.	6.5
286.	6.7
329.	5.0
352.	3.6
402.	1.9
451.	-.3
502.	-1.7
552.	-2.1
578.	-2.4

DATE	670118
SRVY	48
TIME	1200
----	------
0.	8.3
50.	7.4
100.	6.8
150.	6.9
201.	6.6
251.	6.4
302.	5.6
351.	4.5
401.	2.7
452.	-.6
502.	-.5
552.	-.8
603.	-1.5

DATE	670303
SRVY	49
TIME	1200
----	------
0.	8.2
50.	7.0
100.	6.6
151.	6.7
201.	7.1
251.	6.7
301.	4.0
351.	1.9
402.	1.0
452.	1.6
502.	.5
553.	-1.1
603.	-3.4

DATE	670915
SRVY	50
TIME	1200
----	------
0.	8.1
50.	7.1
100.	6.7
150.	6.4
200.	6.9
250.	6.9
300.	5.4
349.	5.9
400.	2.3
450.	.9
500.	-.5
600.	-2.9

DATE	670919
SRVY	51
TIME	1200
----	------
0.	8.1
50.	7.4
100.	7.0
150.	6.7
200.	6.9
250.	7.0
350.	4.9
401.	2.9
450.	.3
500.	-1.1
550.	-2.3

DATE	671213
SRVY	52
TIME	1200
----	------
0.	7.8
50.	7.5
100.	6.7
150.	6.9
200.	7.2
250.	7.3
270.	6.6
300.	4.7
350.	2.7
400.	1.5
450.	.7
500.	0.0
550.	-1.2
600.	-2.8
650.	-1.6
700.	-2.0

DATE	680115
SRVY	53
TIME	1200
----	------
99.	6.8
149.	7.0
200.	7.3
250.	7.4
300.	4.5
350.	1.3
400.	.9
450.	0.0
500.	-.9
550.	-1.9

DATE	680124
SRVY	54
TIME	1200
----	------
0.	8.0
50.	7.5
100.	6.9
150.	6.9
200.	7.3
250.	7.3
300.	4.7
350.	2.2
400.	1.2
450.	-.2
500.	-.8
550.	-.4
599.	-.9
629.	-2.0

DATE	680130
SRVY	55
TIME	1200
----	------
250.	7.4
300.	5.2
350.	1.4
400.	1.2
450.	-.1
500.	-.4
550.	-1.0
600.	-1.3
650.	-1.7
700.	-2.3

DATE	680208
SRVY	56
TIME	1200
----	------
-1.	8.0
50.	7.5
100.	6.8
149.	6.8
200.	7.1
250.	7.3
300.	5.0
350.	1.5
400.	1.2
450.	-.4
500.	-.8
550.	-1.4

DATE	680215
SRVY	57
TIME	1200
----	------
0.	8.0
50.	7.2
100.	6.7
149.	6.8
199.	7.0
250.	7.1
300.	5.0
351.	1.6
400.	1.6
450.	.3
500.	-1.1
550.	.1
600.	.1
650.	-1.6
700.	-2.5

DATE 680221		DATE 680226		DATE 680307		DATE 680313		DATE 680322		DATE 681007		DATE 681025		DATE 681115	
BRVY 56		BRVY 58		BRVY 60		BRVY 61		BRVY 62		BRVY 63		BRVY 66		BRVY 65	
TIME 1800		TIME 1800		TIME 1800		TIME 1800		TIME 1800		TIME 1200		TIME 1200		TIME 1200	
---- ------		---- ------		---- ------		---- ------		---- ------		---- ------		---- ------		---- ------	
-1.	8.1	-1.	6.2	0.	8.3	250.	7.0	250.	7.0	0.	6.8	0.	8.4	0.	8.8
50.	7.1	50.	7.1	50.	7.1	300.	5.3	301.	5.3	50.	6.9	50.	6.9	50.	7.2
100.	6.6	100.	6.6	100.	6.6	350.	1.7	350.	1.6	100.	7.0	100.	7.0	100.	7.2
150.	7.0	150.	6.8	150.	6.8	400.	1.4	400.	1.4	150.	7.0	150.	7.0	150.	7.5
200.	7.2	200.	7.0	200.	7.0	451.	.3	450.	.3	200.	7.2	200.	7.0	200.	7.7
250.	7.2	250.	7.1	251.	7.1	500.	0.0	500.	.0	250.	7.0	250.	7.0	250.	6.8
299.	5.1	300.	5.5	300.	5.0	550.	.0	550.	.1.0	300.	5.8	300.	5.8	300.	5.1
350.	2.3	350.	1.5	350.	1.7	600.	.1.0	599.	.0	350.	5.2	350.	5.8	350.	3.5
399.	1.0	400.	.5	400.	1.0	650.	.1.0	650.	.1.5	400.	6.1	400.	6.3	400.	2.3
449.	.1	449.	.5	450.	0.0	700.	.2.3	700.	.2.3	450.	1.4	450.	2.3	450.	1.2
499.	.1.2	500.	0.0	500.	0.0					500.	0.0	500.	.5	500.	1.1
548.	.7	549.	.1	550.	.1					550.	.0	550.	.5	550.	.7
599.	0.0	599.	.1.0	600.	.1.0					600.	.1.4	600.	.1.2	600.	.1.2
650.	.1.8	650.	.1.8	650.	.1.9									650.	.2.0
700.	.2.5	700.	.2.0												

DATE 681220		DATE 690113		DATE 690122		DATA 690129		DATE 690205		DATE 690212		DATE 690219		DATE 690226	
BRVY 66		BRVY 67		BRVY 68		BRVY 69		BRVY 70		BRVY 71		BRVY 72		BRVY 73	
TIME 1200		TIME 1800		TIME 1200		TIME 1200		TIME 1800		TIME 1200		TIME 1800		TIME 1200	
---- ------		---- ------		---- ------		---- ------		---- ------		---- ------		---- ------		---- ------	
0.	8.3	0.	8.4	0.	8.5	0.	8.5	0.	8.6	0.	8.6	0.	8.6	0.	8.6
50.	6.9	50.	6.7	50.	6.7	50.	6.6	50.	6.6	50.	6.6	50.	6.6	50.	6.7
100.	6.6	100.	6.5	100.	6.8	100.	6.7	100.	6.5	100.	6.5	100.	6.6	100.	6.5
150.	7.3	150.	7.0	150.	7.0	150.	6.9	150.	6.7	150.	6.7	150.	6.8	150.	6.8
200.	7.7	200.	7.6	200.	7.6	200.	7.6	200.	7.5	200.	7.5	200.	7.5	200.	7.4
250.	6.9	250.	7.6	250.	7.3	250.	7.2	250.	7.1	250.	7.1	250.	7.1	250.	7.5
300.	5.1	300.	5.4	300.	5.1	300.	5.2	300.	5.2	300.	5.3	300.	5.1	300.	5.9
350.	4.7	350.	4.1	350.	3.3	350.	3.1	350.	3.6	350.	4.5	350.	2.9	350.	2.6
400.	2.8	400.	2.9	400.	4.0	400.	1.7	400.	2.6	400.	3.5	400.	1.6	400.	1.0
450.	1.0	450.	1.3	450.	.6	450.	.9	450.	1.2	450.	.1	450.	.4	450.	.6
500.	.3	500.	.5	500.	.5	500.	.6	500.	.2	500.	.1.8	500.	.1.7	500.	.1.7
550.	.1.8	550.	.1.5	550.	.1.8	550.	.2.0	550.	.1.0	550.	.1.4				
600.	.1.4							600.	.2.2	600.	.1.0				
								650.	.2.2						
								700.	.3.7						

DATE 690305		DATE 690312		DATE 690319		DATE 690327		DATE 690403		DATE 691083		DATE 691120		DATE 691216	
BRVY 74		BRVY 75		BRVY 76		BRVY 77		BRVY 78		BRVY 79		BRVY 80		BRVY 81	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------
0.	0.5	0.	0.5	0.	0.5	50.	6.3	0.	6.2	0.	6.3	0.	6.4	0.	6.4
50.	6.2	50.	6.4	50.	6.4	100.	6.4	50.	6.7	50.	6.9	15.	7.5	20.	7.2
100.	6.5	100.	6.9	100.	6.4	150.	6.7	100.	6.2	100.	6.2	50.	6.9	50.	6.9
150.	6.8	150.	6.7	150.	6.7	200.	7.2	150.	6.7	150.	6.7	100.	6.3	100.	6.3
200.	7.5	200.	7.4	200.	7.3	250.	7.3	200.	7.4	200.	7.2	114.	6.2	118.	6.3
250.	7.3	250.	7.4	250.	7.4	300.	9.0	250.	7.3	250.	7.3	150.	6.8	130.	7.0
300.	3.3	300.	4.5	300.	4.5	350.	4.3	300.	6.2	276.	5.9	200.	7.3	150.	6.7
350.	2.3	350.	3.7	350.	3.7	400.	1.1	350.	6.6	300.	6.2	235.	7.6	200.	7.3
400.	1.4	400.	2.5	450.	1.5	450.	1.2	400.	2.8	348.	6.6	250.	7.1	250.	7.3
450.	0.0	450.	.1	450.	.1	500.	.6	450.	1.4	350.	6.6	264.	6.9	276.	7.3
500.	.1	500.	.2	500.	.2			500.	.3	400.	3.0	300.	6.9	300.	6.4
550.	.1									450.	1.4	330.	5.5	350.	5.1
600.	.3									500.	.6	350.	4.8	400.	2.8
650.	.6									550.	.2	400.	3.2	450.	1.5
700.	.7									600.	.1	440.	1.1	500.	.6
750.	.5									650.	.1	450.	.6	550.	0.0
										700.	.2	497.	.1	600.	.2
										750.	.2	500.	.1	650.	.2
												547.	0.0	700.	.2
												600.	.3		
												650.	.1		
												700.	.2		

DATE 700114 SRVY 82 TIME 1200		DATE 700121 SRVY 83 TIME 1200		DATE 700128 SRVY 84 TIME 1200		DATE 700204 SRVY 85 TIME 1200		DATE 700211 SRVY 86 TIME 1200		DATE 700218 SRVY 87 TIME 1200		DATE 700225 SRVY 88 TIME 1200		DATE 700304 SRVY 89 TIME 1200	
50.	8.8	50.	8.6	50.	8.4	50.	8.3	50.	8.2	0.	7.3	50.	8.3	0.	8.0
100.	8.0	100.	7.9	100.	7.9	100.	7.9	100.	7.8	50.	8.4	100.	7.8	50.	8.2
150.	7.4	150.	7.7	150.	7.6	150.	7.6	150.	7.5	100.	8.0	150.	7.6	100.	7.8
200.	7.2	200.	7.1	200.	7.2	200.	7.3	200.	7.2	150.	7.8	200.	7.2	150.	7.6
250.	7.4	250.	7.3	250.	7.3	250.	7.2	242.	7.3	200.	7.3	247.	7.3	200.	7.2
300.	6.9	300.	7.6	250.	7.1	300.	6.4	250.	6.7	250.	7.3	250.	7.2	251.	7.3
350.	3.0	333.	6.6	288.	6.6	350.	2.5	300.	3.6	260.	7.1	300.	6.1	300.	6.6
400.	2.0	350.	3.4	300.	4.6	400.	1.1	350.	1.6	275.	5.8	350.	2.8	350.	2.7
450.	1.6	400.	1.8	350.	3.0	450.	-.1	400.	.4	300.	6.4	400.	.4	400.	1.3
500.	.8	450.	.1	400.	1.2	500.	-1.3	450.	-.1	350.	2.3	450.	-.1	450.	-.2
	-2.0	500.	-1.0	450.	-.4	550.	-2.9	500.	-1.1	400.	-.7	500.	-1.1	500.	-1.7
		578.	-3.6	500.	-1.4			550.	-2.7	450.	-.5	550.	-3.2		
				550.	-3.6					500.	-.7				
										550.	-2.2				

DATE 700311 SRVY 90 TIME 1200		DATE 700318 SRVY 91 TIME 1200		DATE 700318 SRVY 92 TIME 1200		DATE 700326 SRVY 93 TIME 1200		DATE 701015 SRVY 94 TIME 1200		DATE 701106 SRVY 95 TIME 1200		DATE 701209 SRVY 96 TIME 1200		DATE 701218 SRVY 97 TIME 1200	
50.	8.1	50.	8.2	50.	8.2	0.	6.9	0.	6.5	0.	6.7	0.	6.7	0.	7.2
100.	7.8	100.	7.9	100.	8.0	50.	8.2	50.	8.4	50.	8.4	50.	8.0	50.	8.6
150.	7.5	150.	7.9	150.	7.8	100.	7.9	100.	8.4	100.	8.4	100.	8.2	89.	8.4
200.	7.1	200.	7.8	200.	7.1	150.	7.4	150.	7.8	150.	7.7	150.	7.4	95.	8.7
250.	7.1	248.	7.2	250.	7.2	200.	7.1	200.	7.1	200.	7.3	200.	7.1	100.	9.3
300.	4.4	300.	4.3	300.	5.2	250.	7.0	250.	7.1	250.	7.4	250.	7.2	114.	8.0
350.	2.2	350.	2.9	350.	3.5	300.	6.4	300.	6.3	267.	7.1	300.	6.4	150.	7.4
400.	1.7	400.	2.7	400.	1.0	342.	6.1	338.	6.7	300.	5.0	350.	3.1	200.	7.3
450.	.8	422.	2.2	450.	0.0	350.	6.2	350.	5.2	350.	2.0	400.	.9	250.	7.4
500.	-1.8	450.	0.0	500.	-2.1	400.	2.9	400.	1.7	400.	1.2	450.	-.1	255.	7.4
550.	-4.8	500.	-2.2			450.	-.5	450.	.4	450.	-.7	500.	-1.4	300.	4.0
		538.	-4.6			480.	-2.9	500.	-2.7	500.	-2.7			350.	2.9
						513.	-1.7	550.	-4.1	550.	-2.4			400.	1.9
						550.	-1.8	600.	-4.2					450.	.2
						600.	-2.4								
						650.	-3.3								

DATE 710113		DATE 710205		DATE 710311		DATE 710412		DATE 710607		DATE 710816		DATE 711004		DATE 711213	
BRVY 98		BRVY 99		BRVY 100		BRVY 101		BRVY 102		BRVY 103		BRVY 104		BRVY 105	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200	
0.	7.3	0.	7.4	0.	7.4	0.	6.6	0.	6.6	0.	6.6	0.	6.5	0.	7.2
50.	8.3	50.	A.P	50.	7.8	50.	7.6	50.	8.2	50.	8.4	33.	8.2	50.	8.7
100.	8.9	100.	A.6	100.	9.1	100.	A.2	100.	8.3	100.	8.0	50.	8.4	100.	8.1
150.	7.3	150.	7.2	150.	7.4	150.	7.4	150.	7.4	150.	7.4	100.	8.1	150.	7.4
200.	7.2	200.	7.2	200.	7.3	200.	7.6	200.	7.3	200.	7.4	150.	7.3	200.	7.3
248.	7.3	250.	7.2	248.	7.3	225.	7.3	250.	5.7	250.	6.0	200.	7.4	230.	6.4
284.	5.0	300.	4.F	284.	4.9	250.	5.5	290.	5.5	300.	5.7	236.	6.6	300.	7.0
300.	4.5	350.	1.8	300.	4.2	300.	3.6	300.	4.0	329.	6.1	250.	6.5	325.	7.1
332.	4.7	400.	.2	350.	2.6	350.	1.4	335.	4.9	350.	4.0	300.	7.1	350.	6.6
350.	3.9	450.	=.8	400.	1.2	400.	.3	350.	3.8	400.	1.1	329.	7.4	400.	3.5
400.	1.1	900.	=1.P	450.	0.0	450.	=1.3	375.	2.0	450.	=.5	350.	4.9	450.	1.9
450.	=1.3	925.	=2.1	500.	=1.3	300.	=1.8	400.	=.4	500.	=.8	400.	2.3	500.	.3
475.	=2.8			550.	=1.8	550.	=1.6	450.	=1.4	600.	=1.6	450.	=.3	550.	=1.8
				600.	=3.0	600.	=3.0	500.	=.9			500.	=.2	575.	=2.6
								550.	=1.7			550.	=1.4		
								400.	=3.6			575.	=2.5		

DATE 720110		DATE 720214		DATE 720222		DATE 720317		DATE 720410		DATE 720821		DATE 721020		DATE 721208	
BRVY 106		BRVY 107		BRVY 108		BRVY 109		BRVY 110		BRVY 111		BRVY 112		BRVY 113	
TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1200		TIME 1500		TIME 1100		TIME 1500	
0.	7.4	0.	7.6	0.	7.1	0.	8.0	0.	7.4	0.	6.5	0.	7.7	0.	8.3
50.	8.6	50.	A.3	100.	8.0	50.	9.3	50.	8.0	25.	7.7	50.	7.5	50.	8.6
100.	8.0	100.	A.2	150.	7.9	100.	9.6	100.	8.4	50.	8.5	100.	8.2	100.	7.8
150.	7.3	150.	7.4	200.	7.2	150.	A.4	150.	7.3	100.	8.2	150.	7.3	150.	7.3
200.	7.1	200.	7.4	250.	7.2	200.	A.2	200.	7.1	150.	7.3	200.	7.4	200.	7.5
250.	6.4	250.	7.3	280.	7.4	250.	A.3	250.	7.3	200.	7.0	250.	7.6	250.	7.7
300.	6.9	300.	7.3	273.	7.2	277.	A.1	261.	7.0	250.	6.7	300.	7.0	264.	7.5
325.	6.9	350.	4.7	300.	5.8	300.	6.7	300.	4.7	300.	6.7	350.	3.6	300.	5.5
350.	5.6	400.	2.A	350.	3.6	350.	4.2	350.	2.0	350.	5.3	400.	1.1	350.	3.0
400.	3.0	450.	1.4	400.	2.2	400.	2.6	400.	.4	375.	4.4	450.	=.3	400.	1.3
450.	1.1	500.	.1	450.	1.1	450.	1.3	410.	.3	400.	1.6	500.	=.6	450.	=.1
500.	=.3	550.	=.9	500.	.4	500.	0.0	412.	1.7	429.	1.6	938.	=1.8	500.	=.8
550.	=1.5	575.	=1.2	550.	=.7	550.	=.7	450.	1.4	450.	2.6			985.	=2.2
575.	=2.0	600.	=1.5	575.	=1.2			500.	=.5	500.	2.3				
								525.	=1.3	550.	.2				
								550.	=2.3	600.	=2.3				

DATE	730105
SRVY	114
TIME	1100
----	------
0.	8.2
50.	8.8
100.	8.1
150.	7.4
200.	7.7
250.	7.8
300.	4.5
350.	2.6
400.	1.5
450.	.4
500.	-.4
550.	-1.4

DATE	730216
SRVY	115
TIME	1100
----	------
0.	8.F
50.	8.[illegible]
100.	7.9
150.	7.3
200.	7.F
222.	7.9
224.	7.F
250.	5.5
300.	2.9
350.	1.8
400.	.3
450.	-.5
500.	-1.0

DATE	730316
SRVY	116
TIME	1000
----	------
0.	8.0
50.	8.2
100.	7.9
150.	7.3
200.	7.5
225.	7.8
250.	5.7
300.	3.0
350.	1.0
400.	-2.1
450.	-1.6
500.	-2.1

DATE	730325
SRVY	117
TIME	700
----	------
0.	8.1
50.	8.2
100.	7.9
150.	7.6
190.	7.7
250.	2.4
300.	.0
317.	-1.2
340.	.6
350.	.6
400.	.3
450.	-.7
500.	-1.6

DATE	730405
SRVY	118
TIME	1400
----	------
0.	8.0
50.	8.1
100.	7.9
150.	7.7
191.	7.6
200.	6.8
250.	3.6
300.	1.5
350.	1.2
400.	.7
450.	-.8
500.	-.9
550.	-3.3

DATE	730418
SRVY	119
TIME	1300
----	------
0.	7.9
50.	8.0
100.	7.8
150.	7.4
195.	8.0
250.	3.9
300.	2.4
350.	2.1
400.	1.3
450.	.8
500.	-.8
550.	-2.8

DATE	621024
SRVY	1
TIME	1200
----	------
51.	7.3
86.	6.4
132.	6.2
201.	4.8
236.	5.2
285.	5.0
337.	6.2
378.	2.1
421.	-.1
436.	-.6
505.	-2.1

DATE	621101
SRVY	2
TIME	1200
----	------
16.	8.0
62.	6.8
136.	5.1
186.	5.C
219.	4.7
270.	5.5
331.	6.6
371.	1.9
420.	-.2
486.	-1.3
531.	-2.C

DATE	621109
SRVY	3
TIME	1200
----	------
17.	8.0
86.	6.3
186.	5.3
237.	4.4
293.	3.3
345.	1.4
404.	.8
511.	-2.0

DATE	621212
SRVY	4
TIME	1200
----	------
9.	7.7
87.	6.9
121.	7.3
159.	6.4
201.	4.9
273.	2.6
358.	.2
378.	1.1
439.	-.6
479.	-3.6

DATE	630109
SRVY	5
TIME	1200
----	------
-1.	8.6
21.	7.3
29.	7.0
50.	7.1
86.	6.9
128.	7.4
150.	6.8
190.	5.5
201.	5.9
226.	6.1
251.	3.6
301.	1.1
350.	-.1
379.	-1.3

DATE	630116
SRVY	6
TIME	1200
----	------
21.	7.3
50.	7.0
99.	6.8
126.	7.4
136.	7.3
173.	5.9
191.	5.9
206.	5.8
227.	5.9
251.	4.0
275.	2.9
301.	2.4
326.	1.2
350.	-.5
376.	-1.4

DATE	630122
SRVY	7
TIME	1200
----	------
20.	7.4
29.	8.0
50.	7.0
99.	6.8
124.	7.3
132.	6.9
151.	6.5
176.	5.7
193.	5.5
227.	6.2
251.	4.4
297.	2.3
350.	-.2
376.	-1.0

DATE	630130
SRVY	8
TIME	1200
----	------
0.	8.4
15.	7.7
20.	7.3
50.	7.0
100.	6.8
120.	7.4
123.	7.4
131.	8.0
141.	8.1
147.	6.5
175.	5.9
190.	5.5
200.	5.7
226.	6.0
232.	6.0
255.	5.2
271.	3.7
300.	2.5
326.	2.0
329.	1.8
350.	.9
401.	0.0
451.	-1.0

DATE 630205	
BRVY	9
TIME	1200
----	------
49.	10.8
100.	8.9
150.	7.8
201.	7.0
225.	6.9
250.	6.7
276.	5.5
301.	4.4
350.	3.5
375.	2.7
401.	1.6
450.	.8
501.	-1.1

DATE 630213	
BRVY	10
TIME	1200
----	------
276.	5.3
300.	4.7
350.	3.0
400.	1.0
425.	.2
450.	0.0
501.	-1.8

DATE 630221	
BRVY	11
TIME	1200
----	------
-1.	10.5
49.	10.1
100.	8.8
124.	8.0
150.	7.8
174.	7.1
200.	7.0
225.	6.8
251.	6.3
302.	4.5
350.	2.9
402.	.9
450.	-.2
476.	-.9
500.	-1.8

DATE 630227	
BRVY	12
TIME	1200
----	------
74.	9.4
100.	8.8
125.	8.1
150.	7.7
200.	7.0
224.	6.8
249.	6.3
275.	5.5
300.	4.6
325.	4.3
350.	2.8
375.	1.3
400.	.5
425.	.2
450.	-.6
476.	-1.0
501.	-2.0

DATE 630307	
BRVY	13
TIME	1200
----	------
275.	5.5
300.	5.0
324.	3.7
350.	2.7
375.	1.4
429.	0.0
450.	-.8
500.	-1.3

DATE 630313	
BRVY	14
TIME	1200
----	------
-1.	10.5
49.	10.0
100.	8.9
150.	7.8
201.	7.0
226.	6.8
251.	6.2
278.	5.5
301.	5.0
351.	2.6
375.	1.5
401.	.7
431.	0.0
451.	-.6
476.	-1.0

DATE 630321	
BRVY	15
TIME	1200
----	------
100.	8.9
125.	8.0
150.	7.5
200.	6.9
225.	6.8
250.	6.2
275.	5.6
301.	5.2
326.	3.6
351.	2.2
401.	.3
424.	-.5
451.	-1.0

DATE 630402	
BRVY	16
TIME	1200
----	------
-1.	10.5
6.	10.0
25.	10.1
50.	10.0
100.	8.8
125.	8.3
173.	7.2
201.	6.9
225.	6.8
250.	6.2
275.	5.7
326.	3.8
351.	2.5
401.	.6
426.	.3
475.	-.4
501.	-1.1

DATE 630523	
BRVY	17
TIME	1200
----	------
100.	8.8
125.	7.5
150.	6.8
200.	6.8
224.	6.6
251.	6.0
276.	5.6
303.	5.8
325.	3.5
350.	1.8
401.	.8
451.	-1.1

DATE 630611	
BRVY	18
TIME	1200
----	------
0.	10.4
49.	10.0
100.	8.8
150.	7.4
200.	6.7
225.	6.6
250.	6.2
275.	6.2
300.	5.2
325.	3.4
350.	2.3
375.	1.8
400.	1.2
450.	-.2
476.	-1.1

DATE 630626	
BRVY	19
TIME	1200
----	------
250.	6.2
300.	5.5
350.	3.0
376.	2.3
401.	.8
425.	-.2
450.	-1.1

DATE 630712	
BRVY	20
TIME	1200
----	------
-1.	10.1
50.	9.8
100.	8.8
150.	7.6
199.	6.9
250.	6.2
275.	6.0
301.	5.3
325.	4.2
351.	1.9
373.	.8
401.	-.3
425.	-1.3

DATE 630724	
BRVY	21
TIME	1200
----	------
-1.	10.1
49.	10.0
99.	8.9
150.	7.8
200.	6.8
250.	6.2
276.	6.2
300.	5.8
325.	2.9
351.	1.5
379.	.8
400.	.2
425.	-.4
450.	-1.7

DATE 630807	
BRVY	22
TIME	1200
----	------
0.	10.1
50.	10.0
100.	8.8
150.	7.9
201.	6.9
225.	6.8
251.	6.3
276.	6.0
301.	6.3
325.	4.9
351.	3.2
376.	1.5
401.	.5
423.	-.1
451.	-1.3

DATE 630823	
BRVY	23
TIME	1200
----	------
49.	10.0
100.	9.0
150.	7.8
202.	6.8
251.	6.3
277.	6.2
301.	6.2
325.	4.7
351.	3.1
377.	1.8
401.	1.0
425.	.4
451.	.2
501.	-.6

DATE 630905	
BRVY	24
TIME	1200
----	------
100.	8.8
151.	7.5
183.	7.2
223.	6.5
251.	6.3
277.	6.2
301.	5.5
325.	3.8
351.	2.7

DATE 630925	
SRVY 25	
TIME 1200	
----	------
-35.	11.1
-3.	11.1
0.	10.6
50.	9.8
101.	8.7
152.	7.4
201.	6.6
252.	6.1
276.	5.7
277.	5.7
303.	4.3
328.	3.4
354.	1.8
379.	1.3
403.	.5
428.	-.7

DATE 631009	
SRVY 26	
TIME 1200	
----	------
50.	9.9
101.	8.5
152.	7.0
202.	6.5
227.	6.2
252.	5.4
277.	4.8
302.	2.9
353.	.8
403.	-.8
429.	-1.6

DATE 631028	
SRVY 27	
TIME 1200	
----	------
-35.	11.1
-4.	11.1
0.	10.6
25.	9.9
50.	10.0
101.	8.8
151.	7.5
202.	6.8
252.	6.3
302.	3.5
327.	2.0
354.	1.2
403.	-.1
426.	-.6
453.	-1.1

DATE 631114	
SRVY 28	
TIME 1200	
----	------
-35.	11.1
-4.	11.1
0.	10.5
25.	9.9
50.	10.3
101.	8.9
151.	8.0
202.	6.8
227.	6.3
277.	4.3
302.	2.9
327.	2.2
352.	1.4
378.	.9
402.	.4
453.	-.6
478.	-1.4

DATE 640117	
SRVY 30	
TIME 1200	
----	------
-35.	11.1
-3.	11.1
0.	10.6
50.	9.7
100.	9.0
129.	8.0
175.	7.3
202.	7.0
253.	5.3
281.	3.8
303.	3.0
353.	1.8
378.	.9
404.	.2
454.	-.8
480.	-1.0
504.	-1.6
520.	-2.4

DATE 640214	
SRVY 31	
TIME 1800	
----	------
201.	7.1
252.	5.6
303.	2.9
354.	1.0
403.	.2
454.	-.5

DATE 640312	
SRVY 32	
TIME 1200	
----	------
0.	10.7
50.	9.7
101.	9.0
129.	8.0
152.	7.8
202.	7.1
252.	5.6
303.	4.8
328.	4.2
353.	2.8
379.	1.7
403.	.9
429.	-.1
478.	-1.5

DATE 640409	
SRVY 33	
TIME 1200	
----	------
-1.	10.7
50.	9.7
101.	8.9
151.	7.9
202.	7.0
251.	5.7
302.	4.2
353.	2.5
404.	.9
453.	-.6
504.	-1.8
554.	-2.8
605.	-4.4

DATE 640527	
SRVY 34	
TIME 1200	
----	------
0.	10.7
49.	9.7
100.	8.8
151.	7.7
201.	7.1
251.	6.0
302.	4.6
352.	2.8
402.	.8
454.	-.8
503.	-3.2

DATE 640624	
SRVY 35	
TIME 1800	
----	------
-1.	10.6
50.	9.7
100.	8.9
151.	7.8
201.	7.0
251.	6.0
302.	4.6
353.	2.9
378.	1.8
403.	.6
453.	-.8
479.	-1.3

DATE 640831	
SRVY 36	
TIME 1200	
----	------
0.	10.6
50.	10.0
101.	8.9
151.	8.0
202.	7.3
252.	6.1
303.	5.7
353.	3.4
368.	3.1
403.	2.9
453.	1.1
504.	.1
554.	-1.8

DATE 640925	
SRVY 37	
TIME 1200	
----	------
0.	10.5
50.	9.6
101.	8.7
152.	7.8
202.	7.7
252.	6.2
302.	4.5
353.	3.0
403.	2.0
454.	1.0
503.	.1
529.	-1.0

DATE 641203	
SRVY 38	
TIME 1800	
----	------
50.	10.5
100.	9.5
151.	8.6
201.	8.3
252.	6.8
302.	5.9
353.	4.9
403.	4.0
454.	2.2
504.	.3
554.	-1.1
605.	-1.8

DATE 650120	
SRVY 39	
TIME 1200	
----	------
50.	11.5
100.	10.5
151.	9.7
201.	8.9
252.	8.4
302.	7.8
353.	5.7
403.	4.3
453.	2.9
504.	1.7
554.	.7
655.	-2.4

DATE 650428	
SRVY 40	
TIME 1200	
----	------
0.	11.7
51.	10.4
100.	9.4
151.	8.6
202.	8.3
252.	7.2
302.	6.6
337.	6.7
403.	2.6
453.	1.0
504.	0.0
553.	-1.7

DATE 650908	
SRVY 41	
TIME 1200	
----	------
0.	11.7
50.	10.4
100.	9.4
151.	8.7
201.	7.8
252.	6.9
302.	6.6
352.	6.3
403.	4.4
453.	2.1
504.	.4
554.	-.8
604.	-1.6
639.	-1.9

DATE 651029 SRVY 42 TIME 1200		DATE 651220 SRVY 43 TIME 1200		DATE 660126 SRVY 44 TIME 1200		DATE 660329 SRVY 45 TIME 1200		DATE 660426 SRVY 46 TIME 1200		DATE 661103 SRVY 47 TIME 1200		DATE 670118 SRVY 48 TIME 1200		DATE 670503 SRVY 49 TIME 1200	
0.	12.2	0.	12.9	50.	10.7	0.	12.5	0.	12.5	0.	12.6	0.	12.5	0.	12.5
51.	10.3	50.	10.6	100.	9.7	49.	10.8	49.	10.4	49.	10.7	50.	10.5	50.	10.3
100.	9.4	100.	9.3	150.	8.9	100.	9.5	100.	9.5	100.	9.7	100.	9.4	101.	9.2
152.	8.7	151.	8.7	200.	8.3	151.	8.8	150.	8.8	150.	8.6	151.	8.7	151.	8.7
202.	7.7	202.	7.8	251.	7.6	201.	8.0	201.	8.4	201.	8.1	201.	8.0	201.	8.0
252.	6.8	252.	7.6	301.	6.7	251.	7.5	251.	7.5	251.	7.4	251.	7.4	252.	7.4
302.	6.4	302.	6.9	351.	5.6	301.	7.1	301.	7.3	302.	7.3	302.	7.4	291.	6.1
352.	7.0	340.	6.6	402.	4.7	351.	5.4	351.	5.9	339.	7.3	352.	6.2	352.	2.9
377.	4.8	353.	5.6	452.	3.7	402.	3.3	402.	3.3	402.	2.9	403.	5.2	402.	.9
403.	3.2	402.	3.8	503.	.5	502.	-.4			452.	.2	453.	3.4	453.	-1.3
428.	2.4	454.	3.3	603.	-1.1	593.	-1.8			503.	-1.8	503.	.8	503.	-3.7
454.	1.9	503.	2.0	653.	-1.9					553.	-1.2	553.	-1.1		
478.	1.4	554.	.1							603.	-1.3				
504.	0.0	604.	-1.9												
544.	-1.5	655.	-3.1												

DATE 670915 SRVY 50 TIME 1200		DATE 670918 SRVY 51 TIME 1200		DATE 671213 SRVY 52 TIME 1200		DATE 680115 SRVY 53 TIME 1200		DATE 680124 SRVY 54 TIME 1200		DATE 680130 SRVY 55 TIME 1200		DATE 680208 SRVY 56 TIME 1200		DATE 680215 SRVY 57 TIME 1200	
0.	12.5	200.	8.2	0.	12.8	-1.	12.1	0.	12.1	200.	9.2	-1.	12.0	-1.	12.0
49.	10.8	250.	8.2	50.	11.4	49.	11.4	50.	11.3	250.	8.7	49.	11.3	49.	11.1
100.	9.8	300.	7.6	100.	10.0	100.	10.0	100.	9.7	300.	6.8	99.	9.7	100.	9.6
149.	8.7	350.	6.1	150.	9.2	150.	9.2	150.	9.2	350.	3.7	149.	9.2	149.	9.0
200.	8.2	400.	4.9	200.	8.1	200.	9.2	200.	9.2	400.	1.6	200.	9.0	200.	9.0
250.	7.9	450.	3.7	250.	8.1	250.	8.3	249.	8.7	450.	.3	249.	8.3	250.	8.2
300.	6.8	500.	1.8	300.	7.3	300.	6.3	300.	6.4	500.	-2.0	300.	8.4	299.	6.9
350.	6.3	550.	-.9	350.	6.2	350.	4.3	350.	4.6	550.	-2.0	350.	4.1	350.	4.1
400.	5.4	600.	-1.9	400.	3.4	400.	2.7	400.	3.6	599.	-1.8	400.	1.9	400.	1.8
450.	3.3			450.	2.0	450.	1.0	450.	1.8	650.	-2.0	449.	.3	449.	.1
500.	1.8			499.	.6	499.	-1.2	500.	-1.2			500.	-.5	499.	-.1
550.	.7			550.	-.5	550.	-4.1	550.	-3.0					549.	-.7
601.	-.6			600.	-2.2									600.	-1.9
650.	-1.3													649.	-2.8
700.	-1.8													700.	-1.8

DATE 680221	
SRVY	58
TIME	1200
-1.	12.1
50.	11.6
100.	9.7
150.	9.0
200.	9.1
250.	8.1
300.	6.8
350.	4.2
399.	2.1
450.	1.4
500.	.5
550.	-1.2
600.	-2.1

DATE 680226	
SRVY	59
TIME	1200
50.	11.1
101.	9.8
150.	9.1
201.	9.1
250.	8.2
300.	6.8
350.	4.0
400.	2.1
449.	1.0
500.	0.0
550.	-1.0
599.	-2.2
650.	-2.9

DATE 680307	
SRVY	60
TIME	1200
-1.	18.1
49.	11.0
99.	9.9
149.	9.1
200.	9.2
250.	8.2
300.	7.0
350.	4.3
400.	2.4
450.	1.1
500.	0.0
550.	-1.3

DATE 680313	
SRVY	61
TIME	1200
199.	9.1
249.	7.9
300.	6.9
350.	4.6
400.	2.8
450.	1.1
499.	0.0
550.	-1.1
600.	-2.4

DATE 680322	
SRVY	62
TIME	1200
300.	6.9
350.	4.3
401.	2.0
450.	0.0
500.	0.0
550.	-.8
599.	-1.1
650.	-1.7

DATE 681007	
SRVY	63
TIME	1200
0.	12.4
50.	11.2
100.	9.9
150.	9.2
200.	8.3
250.	8.3
300.	7.5
350.	5.4
400.	6.6
450.	3.2
510.	1.1
550.	-.7
600.	-1.7

DATE 681025	
SRVY	64
TIME	1200
0.	12.4
50.	11.1
100.	9.9
150.	9.2
200.	8.3
250.	8.2
300.	7.4
350.	6.6
400.	4.4
450.	4.3
500.	1.2
550.	-.3
600.	-1.1

DATE 681115	
SRVY	65
TIME	1200
0.	12.4
50.	11.1
100.	9.9
150.	9.1
200.	8.4
250.	8.4
300.	6.4
350.	4.6
400.	3.1
450.	2.0
500.	.9
550.	-.4
600.	-1.4
650.	-1.8

DATE 681220	
SRVY	66
TIME	1200
0.	12.3
50.	11.1
100.	10.0
150.	9.1
200.	8.5
250.	8.6
300.	6.6
350.	4.9
400.	3.3
450.	1.6
500.	1.1
550.	-1.8

DATE 690113	
SRVY	67
TIME	1200
0.	12.3
50.	10.9
100.	9.9
150.	9.1
200.	8.9
250.	8.6
300.	6.6
350.	4.8
400.	3.3
450.	2.2
500.	1.1
550.	-1.4

DATE 690122	
SRVY	68
TIME	1200
0.	12.4
50.	10.9
100.	9.9
150.	9.1
200.	8.5
250.	8.8
300.	6.2
350.	4.2
400.	2.6
450.	1.5
500.	.3
550.	-.9

DATE 690129	
SRVY	69
TIME	1200
0.	12.3
50.	10.8
100.	9.9
150.	9.1
200.	8.5
250.	8.7
300.	6.4
350.	4.0
400.	2.7
450.	2.5
500.	1.3
550.	-.4
600.	-1.9

DATE 690205	
SRVY	70
TIME	1200
0.	12.3
50.	10.8
100.	9.9
150.	9.2
200.	8.4
250.	8.7
300.	6.4
350.	5.4
400.	3.5
450.	2.1
500.	.5
550.	-.7
600.	-2.4
650.	-3.9

DATE 690212	
SRVY	71
TIME	1200
0.	12.3
50.	10.8
100.	9.9
150.	9.2
200.	8.4
250.	8.7
300.	6.4
350.	5.6
400.	3.6
450.	1.5
500.	-.6
550.	-2.7

DATE 690219	
SRVY	72
TIME	1200
0.	12.4
50.	10.7
100.	9.9
150.	9.2
200.	8.6
250.	8.8
300.	6.1
350.	3.3
400.	1.7
450.	.6
500.	-.4
550.	-1.9

DATE 690226	
SRVY	73
TIME	1200
0.	12.4
50.	10.7
100.	9.9
150.	9.2
200.	8.5
250.	9.4
300.	6.0
350.	3.2
400.	1.3
450.	-.3
500.	-2.4

DATE 690305 SRVY 74 TIME 1200	DATE 690312 SRVY 75 TIME 1200	DATE 690319 SRVY 76 TIME 1200	DATE 690527 SRVY 77 TIME 1200	DATE 690923 SRVY 78 TIME 1200	DATE 691023 SRVY 79 TIME 1200	DATE 691120 SRVY 80 TIME 1200	DATE 691216 SRVY 81 TIME 1200
0. 12.4	0. 12.4	0. 12.4	0. 12.7	50. 10.6	0. 12.3	0. 12.6	0. 12.6
50. 10.7	50. 10.6	50. 10.6	50. 10.9	100. 9.9	50. 10.8	20. 10.8	16. 11.2
100. 9.8	100. 9.8	100. 9.9	100. 10.0	150. 9.3	100. 9.8	50. 11.1	50. 11.0
150. 9.1	150. 9.1	150. 9.1	150. 9.2	200. 8.4	150. 9.1	100. 10.0	100. 10.2
200. 8.5	200. 8.5	200. 8.4	200. 8.8	250. 7.7	200. 8.4	150. 9.2	150. 9.7
250. 8.5	250. 8.5	250. 8.7	250. 9.0	286. 7.4	250. 7.7	200. 8.5	200. 8.5
300. 2.8	300. 3.7	250. 8.5	300. 2.3	300. 6.3	300. 6.6	228. 8.4	232. 7.4
350. *.9	350. 1.8	300. 4.7	350. 1.3	350. 3.8	350. 3.6	250. 7.8	250. 7.8
400. 0.0	400. 1.1	350. 2.4	400. *.5	400. 2.0	386. 3.6	300. 5.9	300. 4.1
450. 0.0	450. 0.0	400. *.8	450. *.5	450. 1.3	400. 2.3	350. 4.2	350. 2.7
500. *.8	500. *1.8	450. *1.3	500. *.8	500. *.8	450. *.8	400. 2.8	400. 2.7
550. *2.2	550. *2.1	500. *1.9	550. *.9	550. *.9	500. *1.3	450. 1.5	450. 1.2
600. *1.9		550. *1.8			550. *2.3	500. *.6	483. 1.2
650. *2.2					562. *.9	550. *1.0	500. *.3
700. *2.6					600. *1.0	600. *1.0	550. *.3
750. *3.0					650. *1.6	650. *1.2	600. *.1
					700. *1.6	700. *1.7	650. *.8
					750. *2.2	750. *2.2	
					800. *3.1		
					825. *4.2		

DATE 700114 SRVY A2 TIME 1200	DATE 700121 SRVY B3 TIME 1200	DATE 700128 SRVY A4 TIME 1200	DATE 700204 SRVY B5 TIME 1200	DATE 700211 SRVY B6 TIME 1200	DATE 700218 SRVY B7 TIME 1200	DATE 700225 SRVY B8 TIME 1200	DATE 700304 SRVY B9 TIME 1200
0. 12.5	0. 12.6	0. 12.6	0. 12.7	0. 12.6	0. 12.6	0. 12.6	0. 12.6
23. 10.8	24. 10.7	16. 10.8	12. 11.2	23. 10.7	50. 10.7	23. 10.5	23. 10.7
50. 10.8	50. 10.7	50. 10.8	50. 10.6	50. 10.7	100. 10.2	50. 10.7	50. 10.7
100. 10.2	100. 10.1	100. 10.2	100. 10.3	100. 10.2	150. 9.5	100. 10.2	100. 11.0
150. 9.3	150. 9.3	150. 9.5	150. 9.3	150. 9.3	200. 8.7	150. 9.3	150. 11.3
200. 8.8	200. 8.8	200. 8.7	200. 8.8	200. 8.8	250. 8.0	200. 8.7	200. 8.7
253. 8.8	225. 7.8	233. 8.5	233. 8.6	237. 8.5	280. 6.5	250. 7.9	250. 8.0
250. 8.0	250. 7.7	250. 7.7	250. 8.0	250. 8.0	300. 5.5	300. 5.4	300. 5.3
300. 6.0	300. 6.2	300. 6.2	300. 5.8	275. 6.5	350. 3.2	400. 2.0	313. 4.7
350. 4.7	325. 5.0	350. 5.6	350. 5.3	300. 5.3	400. 1.7	450. 1.6	337. 3.4
400. 3.2	350. 4.4	400. 5.4	400. 2.3	350. 3.1	450. 1.0	500. 0.0	350. 4.6
416. 3.1	400. 3.7	450. 5.3	450. 1.0	400. 1.5	500. *.1	550. *.7	400. 2.0
450. 2.2	450. 1.6	500. 3.5	500. *.2	450. *.3	550. *2.1	600. *2.2	450. *.7
470. *.3	500. *1.8	550. 1.4	550. *1.9	500. *.4			500. *.9
500. *.5	550. *2.4	600. 1.0	575. *1.9	550. *1.2			
550. *2.5		650. *1.2	588. *2.0	600. *1.7			
		700. *1.8		635. *2.6			

DATE	700311
SRVY	90
TIME	1200
0.	12.6
20.	10.7
50.	10.7
100.	10.3
150.	9.3
200.	8.7
230.	8.8
250.	8.0
300.	6.2
350.	3.4
400.	2.0
450.	.7
500.	-1.0
550.	-1.9
600.	-2.4
650.	-3.2

DATE	700318
SRVY	91
TIME	1200
0.	12.6
20.	10.7
50.	10.7
100.	10.2
150.	9.3
200.	8.7
250.	8.0
300.	6.0
350.	3.7
400.	3.0
450.	.2
500.	-1.2
550.	-1.1

DATE	700318
SRVY	92
TIME	1200
0.	12.6
20.	10.8
50.	10.7
100.	10.1
150.	9.3
200.	8.8
250.	9.8
300.	5.7
350.	3.9
400.	.7
450.	-1.8
500.	-8.2

DATE	700826
SRVY	93
TIME	1200
0.	12.8
20.	10.8
50.	10.7
100.	10.3
150.	9.1
200.	8.5
250.	7.3
300.	5.9
350.	5.1
400.	4.6
450.	3.1
500.	2.0
550.	1.2
600.	-.1
617.	-.8
626.	-1.3
650.	-.3
700.	-1.6
750.	-3.1

DATE	701015
SRVY	94
TIME	1200
0.	11.8
50.	10.9
100.	10.1
150.	8.9
200.	8.0
250.	7.2
300.	5.8
350.	5.1
400.	6.3
414.	6.4
450.	3.5
500.	2.1
550.	.7
565.	.2
600.	-1.3
650.	-2.2
700.	-2.9
735.	-3.7

DATE	701106
SRVY	95
TIME	1200
0.	11.5
8.	10.8
41.	10.5
45.	11.2
50.	10.9
100.	10.3
150.	9.1
200.	8.7
229.	8.2
250.	7.5
300.	6.4
350.	5.4
400.	3.8
450.	3.0
500.	1.4
550.	-.8
583.	-1.6
586.	-2.3

DATE	701209
SRVY	96
TIME	1200
50.	11.0
100.	10.2
150.	9.0
200.	8.5
250.	7.9
300.	6.3
350.	6.5
400.	5.1
450.	2.0
500.	0.0
550.	-.9
600.	-2.0

DATE	701218
SRVY	97
TIME	1200
0.	11.7
21.	10.6
50.	11.1
100.	10.3
150.	9.1
200.	8.7
227.	8.4
250.	7.9
300.	6.1
350.	4.6
371.	3.9
400.	2.9
450.	1.8
500.	.5

DATE	710113
SRVY	98
TIME	1200
0.	11.7
50.	11.0
100.	10.2
150.	9.1
200.	8.6
250.	8.1
300.	6.2
350.	4.8
400.	5.8
450.	2.6
500.	-.5
550.	-1.4

DATE	710209
SRVY	99
TIME	1200
0.	11.9
50.	11.0
100.	10.2
150.	9.2
200.	8.6
250.	8.1
300.	6.8
350.	5.3
400.	2.7
450.	1.2
500.	-.1
550.	-1.3

DATE	710311
SRVY	100
TIME	1200
0.	12.0
10.	10.6
50.	10.7
100.	10.0
150.	9.2
200.	8.7
250.	8.2
300.	6.9
350.	4.9
400.	4.4
450.	2.4
475.	1.4
500.	.4
550.	-8.0

DATE	710412
SRVY	101
TIME	1200
0.	12.1
50.	10.7
100.	9.9
150.	9.1
200.	8.5
250.	8.5
300.	7.6
350.	6.0
400.	5.0
450.	2.9
475.	1.0
500.	-.6
550.	-3.7

DATE	710607
SRVY	102
TIME	1200
0.	11.9
50.	10.7
100.	10.0
150.	9.0
200.	8.5
250.	8.1
300.	7.4
350.	7.3
400.	5.1
450.	2.2
475.	1.0
500.	-.6
550.	-3.7
600.	-4.7

DATE	710816
SRVY	103
TIME	1200
0.	11.2
10.	10.8
50.	10.8
100.	10.0
150.	9.1
200.	8.4
250.	8.1
300.	7.3
350.	7.0
380.	6.0
400.	5.1
425.	3.2
450.	2.1
500.	.4
530.	-.7
575.	-1.5

DATE	711004
SRVY	104
TIME	1200
0.	12.0
50.	11.0
100.	10.0
150.	9.1
200.	8.6
250.	8.4
300.	8.0
350.	6.5
400.	3.6
450.	2.1
500.	-1.1
550.	-2.3

DATE	711213
SRVY	105
TIME	1200
0.	12.2
50.	11.1
100.	10.1
150.	9.0
200.	8.5
250.	8.2
300.	8.0
325.	8.1
350.	8.6
400.	1.9
450.	1.0
500.	0.0
550.	-2.0

DATE	720110
SRVY	106
TIME	1200
----	------
0.	12.3
50.	11.2
100.	10.0
150.	9.0
200.	8.5
250.	8.2
300.	8.0
325.	7.8
350.	5.3
400.	2.7
450.	1.2
500.	-.2
550.	-2.1

DATE	720214
SRVY	107
TIME	1800
----	------
0.	12.2
50.	10.9
100.	10.2
150.	9.0
200.	8.4
250.	8.3
300.	8.2
350.	4.8
400.	2.7
450.	1.2
500.	-.6

DATE	720222
SRVY	108
TIME	1200
----	------
0.	12.4
50.	11.0
100.	10.1
150.	9.0
200.	8.6
250.	8.8
300.	6.2
350.	4.0
400.	2.6
450.	1.3
500.	-.7

DATE	720317
SRVY	109
TIME	1200
----	------
0.	12.3
50.	11.0
100.	10.1
150.	9.0
200.	8.8
250.	8.8
300.	5.8
350.	3.5
400.	2.3
450.	.7
500.	-2.6

DATE	720410
SRVY	110
TIME	1200
----	------
0.	12.4
50.	11.0
100.	10.1
150.	9.1
200.	8.6
250.	8.9
300.	5.8
350.	3.7
400.	2.2
450.	1.6
500.	-.3

DATE	720821
SRVY	111
TIME	1400
----	------
0.	12.0
50.	11.0
100.	11.0
150.	9.0
200.	8.6
250.	8.2
300.	6.1
350.	3.4
375.	2.2
400.	1.4
450.	.7
500.	-.8
525.	-2.3

DATE	721020
SRVY	112
TIME	1200
----	------
0.	12.4
50.	11.3
100.	10.3
150.	9.2
200.	8.9
250.	8.8
300.	7.2
350.	4.7
400.	2.3
450.	.8
500.	-1.8

DATE	721208
SRVY	113
TIME	1400
----	------
0.	12.4
50.	11.0
100.	10.0
150.	9.1
200.	8.7
250.	8.7
300.	6.6
350.	3.7
400.	1.8
450.	.1
500.	-.0

DATE	730105
SRVY	114
TIME	1100
----	------
0.	12.4
50.	10.9
100.	9.9
150.	9.0
200.	8.7
250.	7.9
300.	5.0
350.	2.8
400.	1.3
450.	-.1
500.	-2.4

DATE	730216
SRVY	115
TIME	1000
----	------
0.	12.3
50.	10.9
100.	10.0
150.	9.1
200.	8.7
250.	7.4
300.	4.1
350.	1.9
400.	.7
450.	-.7
500.	-1.8

DATE	730316
SRVY	116
TIME	900
----	------
0.	12.4
50.	10.8
100.	9.9
150.	9.1
200.	8.7
250.	7.7
252.	6.0
300.	3.3
350.	1.4
400.	-.5
450.	-2.1

DATE	730325
SRVY	117
TIME	700
----	------
0.	12.4
50.	10.7
100.	9.9
150.	9.1
200.	8.8
250.	5.7
300.	2.4
350.	1.6
400.	1.0
450.	0.0
500.	2.2

DATE	730405
SRVY	118
TIME	1300
----	------
0.	12.4
50.	10.7
100.	9.9
150.	9.1
200.	8.7
221.	8.7
223.	8.0
250.	6.4
300.	4.5
350.	2.9
400.	1.7
450.	0.0
500.	-1.6
550.	-1.9

DATE	730418
SRVY	119
TIME	1200
----	------
0.	12.4
50.	10.7
100.	9.9
150.	9.0
200.	8.6
220.	8.6
224.	7.9
250.	6.4
300.	4.3
350.	3.0
400.	1.0
450.	-.7
500.	-2.3

DATE	730501
SRVY	120
TIME	1100
----	------
0.	12.4
50.	10.7
100.	9.9
150.	9.1
200.	8.7
250.	6.7
300.	4.6
350.	1.5
400.	-.8
450.	-1.5
500.	-3.0

DATE	621024
SRVY	1
TIME	1200
----	------
30.	7.2
63.	7.2
120.	7.6
180.	5.6
250.	5.6
300.	5.8
327.	6.0
365.	4.7
407.	2.4
450.	-.4
488.	-2.1

DATE	621101
SRVY	2
TIME	1200
----	------
3.	7.4
25.	7.7
65.	7.3
106.	6.8
155.	5.8
212.	5.8
249.	5.3
283.	6.0
331.	5.8
381.	2.7
425.	1.3
486.	-1.9

DATE	621109
SRVY	3
TIME	1200
----	------
27.	7.8
84.	7.1
156.	6.1
184.	6.0
217.	6.5
249.	5.0
301.	6.0
406.	.5
473.	-2.0

DATE	621212
SRVY	4
TIME	1200
----	------
-22.	7.0
24.	8.0
36.	7.9
86.	6.8
144.	6.0
180.	7.2
201.	6.7
264.	2.9
338.	.3
406.	-.7
472.	-2.3
532.	-3.1

DATE	630109
SRVY	5
TIME	1200
----	------
0.	7.5
27.	7.5
75.	7.1
100.	6.7
126.	6.0
150.	5.8
187.	6.6
200.	6.8
226.	5.4
250.	4.1
277.	3.1
350.	.4
374.	-.2
426.	-.3
450.	-.7
476.	-1.5

DATE	630116
SRVY	6
TIME	1200
----	------
26.	7.6
101.	6.5
127.	6.3
151.	5.9
177.	6.7
202.	6.6
226.	5.2
250.	4.8
279.	3.1
327.	1.7
351.	1.6
376.	1.3
400.	.3
432.	-.4
451.	-.7
476.	-1.3

DATE	630122
SRVY	7
TIME	1200
----	------
100.	6.6
126.	6.0
175.	6.8
201.	5.4
251.	3.4
278.	3.2
301.	2.6
351.	1.1
393.	-.3
426.	-1.6

DATE	630130
SRVY	8
TIME	1200
----	------
-1.	7.6
25.	7.5
50.	7.3
74.	7.0
99.	6.5
124.	6.0
149.	5.9
175.	6.4
190.	6.7
200.	6.5
225.	5.4
250.	4.7
301.	3.3
325.	2.4
350.	2.0
400.	.8
450.	-.3
475.	-.5
501.	-1.0

DATE	630205
SRVY	9
TIME	1200
----	------
149.	6.0
175.	6.7
200.	6.4
450.	4.5
276.	4.2
301.	3.4
350.	1.8
401.	1.0
426.	.7
475.	-1.6

DATE	630213
SRVY	10
TIME	1200
----	------
250.	4.7
275.	4.4
300.	3.8
350.	3.0
400.	1.9
450.	0.0
479.	-1.6

DATE	630221
SRVY	11
TIME	1200
----	------
-1.	7.6
50.	7.4
74.	7.1
124.	6.1
150.	6.0
176.	6.6
200.	6.4
251.	5.0
276.	4.3
350.	3.0
401.	2.0
449.	.2

DATE	630227
SRVY	12
TIME	1200
----	------
300.	3.8
325.	3.3
368.	4.4
400.	1.5
426.	.6
451.	0.0
476.	-1.1

DATE	630307
SRVY	13
TIME	1200
----	------
150.	6.0
175.	6.6
200.	6.2
226.	5.7
250.	4.7
275.	4.3
291.	4.4
300.	4.9
325.	5.0
351.	3.2
375.	1.7
400.	.8
451.	0.0
475.	-1.1

DATE	630313
SRVY	14
TIME	1200
----	------
-1.	7.6
24.	7.5
50.	7.2
74.	7.0
100.	6.5
124.	6.0
150.	6.0
190.	6.7
251.	5.0
275.	4.5
300.	5.0
339.	5.1
351.	3.8
375.	2.0
400.	.8
432.	-.1
451.	-.5
474.	-.9

DATE	630321
SRVY	15
TIME	1200
----	------
300.	4.9
327.	5.3
338.	5.3
351.	3.9
400.	.9
425.	.2
451.	-.2
475.	-.1
501.	-1.0

DATE	630402
SRVY	16
TIME	1200
----	------
191.	6.7
225.	5.4
250.	4.8
275.	4.7
300.	5.4
326.	5.5
350.	3.6
375.	2.2
401.	1.3
426.	.8
475.	-.7
501.	-1.7

DATE 630523	
BRVY	17
TIME	1800
----	------
25.	8.0
51.	9.4
74.	7.3
99.	6.5
124.	6.0
151.	6.0
174.	6.2
200.	6.0
225.	5.6
251.	4.9
277.	4.7
285.	5.0
325.	5.0
350.	5.5
375.	3.2
402.	1.4
425.	1.1
451.	.5
477.	-.1
501.	-.9
520.	-1.3

DATE 630611	
BRVY	18
TIME	1800
----	------
0.	6.6
23.	8.1
50.	9.1
75.	7.1
100.	6.4
121.	4.1
151.	6.0
175.	6.4
200.	6.3
250.	5.0
325.	6.0
350.	5.8
377.	2.1
401.	1.2
429.	.4
452.	.8
478.	-.1
501.	-1.4

DATE 630626	
BRVY	19
TIME	1200
----	------
0.	6.9
25.	7.7
51.	8.1
76.	7.6
125.	6.1
151.	6.1
200.	6.3
226.	5.7
251.	5.0
325.	5.8
351.	4.9
401.	1.7
426.	1.2
461.	0.0
501.	-1.7

DATE 630712	
BRVY	20
TIME	1200
----	------
-1.	6.6
24.	7.8
50.	8.0
100.	6.5
124.	5.9
151.	6.0
176.	6.4
224.	5.0
250.	5.0
300.	5.9
325.	5.4
350.	2.7
400.	0.0
450.	-1.0

DATE 630728	
BRVY	21
TIME	1800
----	------
149.	6.0
175.	6.2
200.	6.1
224.	5.3
250.	5.0
300.	6.0
325.	4.9
351.	2.4
400.	.5
428.	0.0
450.	-.5
476.	-.9

DATE 630807	
BRVY	22
TIME	1200
----	------
0.	6.6
25.	7.8
50.	7.9
77.	7.3
100.	6.4
127.	6.0
150.	6.1
175.	6.4
200.	5.8
224.	5.0
251.	6.1
275.	5.4
301.	6.0
326.	5.5
351.	4.0
374.	2.6
400.	1.3
451.	.3
476.	-.4
501.	-1.0

DATE 630823	
BRVY	23
TIME	1200
----	------
27.	7.8
50.	8.1
75.	7.4
100.	6.5
125.	6.0
150.	6.1
176.	6.4
200.	5.9
225.	5.0
250.	5.1
275.	5.7
302.	6.0
325.	5.0
351.	3.5
373.	2.6
400.	1.3
450.	.2
477.	0.0
500.	-.7

DATE 630905	
BRVY	24
TIME	1200
----	------
301.	6.0
351.	2.9

DATE 630925	
BRVY	25
TIME	1200
----	------
125.	6.0
151.	6.2
175.	6.2
202.	5.4
252.	4.7
277.	4.4
326.	1.7
377.	.8
403.	1.2
428.	.2
453.	-.4

DATE 631008	
BRVY	26
TIME	1800
----	------
0.	7.3
25.	8.0
51.	8.0
76.	7.5
101.	6.3
126.	6.0
151.	6.3
177.	6.0
201.	5.2
227.	6.0
252.	5.7
303.	3.9
328.	2.0
352.	1.2
378.	.3
403.	0.0
453.	-1.1

DATE 631028	
BRVY	27
TIME	1200
----	------
25.	7.9
50.	8.4
101.	6.8
126.	6.0
151.	6.0
176.	6.2
226.	5.2
252.	6.3
277.	5.4
302.	4.0
328.	3.7
353.	3.7
377.	1.8
402.	.9
453.	-.9

DATE 631114	
BRVY	28
TIME	1200
----	------
-23.	8.7
0.	7.3
27.	8.1
50.	8.3
100.	6.5
126.	9.9
151.	6.5
201.	6.8
227.	6.4
302.	1.9
327.	1.3
377.	-.4
403.	-.9
453.	-1.1

DATE 640117	
BRVY	30
TIME	1200
----	------
0.	7.8
26.	8.1
51.	8.1
76.	7.9
102.	6.7
127.	6.4
177.	7.0
202.	6.8
252.	4.9
281.	3.7
303.	3.0
353.	1.9
380.	1.7
404.	1.3
454.	-.2
479.	-.9
505.	-1.9

DATE 640214	
BRVY	31
TIME	1200
----	------
0.	7.9
50.	8.0
76.	7.5
101.	6.4
126.	6.5
151.	6.5
176.	6.9
202.	6.8
252.	5.3
277.	4.6
303.	3.3
328.	2.1
378.	.4
403.	0.0
429.	-.2
454.	-.7
479.	-1.3
504.	-1.7
530.	-2.6

DATE 640312	
BRVY	32
TIME	1200
----	------
0.	7.6
50.	8.5
101.	6.5
151.	6.6
202.	6.7
253.	5.1
304.	3.9
353.	2.2
403.	.5
453.	-.4
504.	-1.0
531.	-1.5

DATE 640409	
BRVY	33
TIME	1200
----	------
0.	7.6
50.	8.1
101.	6.5
151.	6.2
202.	7.0
252.	5.2
304.	3.9
353.	2.2
404.	.7
454.	-.3
504.	-1.4
555.	-3.2
590.	-4.0

DATE 640527		DATE 640624		DATE 640831		DATE 640925		DATE 641203		DATE 650120		DATE 650428		DATE 650908	
SRVY	34	SRVY	35	SRVY	36	SRVY	37	SRVY	38	SRVY	39	SRVY	40	SRVY	41
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
0.	8.8	0.	7.4	0.	8.7	0.	6.6	50.	8.9	50.	8.5	-18.	9.6	-19.	9.6
50.	8.5	50.	8.1	51.	8.3	50.	8.3	100.	7.8	100.	7.0	0.	8.7	0.	7.6
100.	7.5	101.	7.1	101.	7.1	101.	7.4	150.	7.5	151.	7.1	51.	9.0	50.	7.2
151.	6.7	151.	7.7	151.	8.6	151.	7.3	201.	7.8	202.	7.2	101.	7.1	101.	7.8
201.	6.6	202.	7.7	202.	6.8	202.	7.4	252.	7.4	252.	6.6	151.	6.9	150.	7.1
252.	5.8	252.	5.9	252.	5.9	249.	7.2	302.	5.3	303.	3.8	202.	7.1	201.	6.7
302.	4.1	302.	4.1	302.	4.5	303.	4.5	353.	3.4	353.	2.3	251.	6.9	251.	6.7
353.	1.1	352.	1.6	353.	4.8	352.	2.3	403.	1.2	403.	.8	303.	4.8	302.	5.5
403.	0.0	378.	1.4	378.	5.0	404.	1.2	453.	-.2	453.	1.3	353.	2.8	342.	5.7
453.	-1.4	403.	.8	403.	2.6	454.	.3	503.	-1.7	554.	-1.3	453.	.5	402.	3.1
504.	-2.3	428.	-.2	453.	1.0	473.	-.1	554.	-1.3	605.	-2.1	554.	-1.1	453.	1.6
		454.	-.6	504.	.2			605.	-2.7	654.	-3.2	604.	-2.2	503.	.7
		504.	-2.0	554.	-1.3							654.	-2.2	554.	-.2
				605.	-2.7									604.	-2.0

DATE 651029		DATE 651220		DATE 660124		DATE 660329		DATE 660426		DATE 661103		DATE 670118		DATE 670503	
SRVY	42	SRVY	43	SRVY	44	SRVY	45	SRVY	46	SRVY	47	SRVY	48	SRVY	49
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
-19.	9.5	-18.	9.5	50.	8.3	0.	6.6	50.	9.1	0.	6.8	0.	8.3	0.	8.6
0.	8.0	0.	6.5	100.	8.0	50.	8.1	100.	8.8	50.	9.1	50.	9.5	51.	9.8
50.	9.0	50.	8.6	151.	7.5	100.	7.8	151.	7.9	100.	8.4	151.	7.0	101.	8.8
101.	8.1	101.	7.9	201.	7.4	150.	7.1	201.	8.0	150.	7.0	201.	7.4	151.	8.0
151.	7.5	152.	7.0	252.	6.3	201.	7.3	252.	7.0	201.	7.2	252.	6.7	201.	8.2
202.	7.4	202.	6.8	302.	5.1	251.	6.6	302.	6.8	251.	6.7	301.	5.9	222.	7.6
252.	7.4	252.	6.9	352.	4.1	301.	5.0	341.	6.3	302.	6.4	352.	3.2	252.	5.7
302.	6.3	302.	5.7	402.	2.5	352.	4.0	392.	4.4	352.	4.8	453.	-.3	302.	3.4
353.	6.6	347.	5.7	492.	1.0	392.	4.9	402.	1.1	402.	2.7	503.	-1.0	352.	2.6
403.	3.5	403.	2.7	503.	0.0	428.	2.0	452.	-.4	452.	1.3			402.	2.1
428.	2.5	453.	1.0	553.	-.4	453.	1.0	502.	-.9	502.	-.1			452.	1.2
454.	2.3	504.	0.0	604.	-1.1	478.	.3			553.	-2.8			503.	0.0
479.	2.4	554.	-.3	654.	-2.5	503.	.3							553.	-2.0
504.	1.8	604.	-1.3			528.	-.6								
530.	.7	655.	-2.8			553.	-1.7								
554.	0.0														
580.	-1.3														

DATE	670913
SRVY	50
TIME	1200
0.	6.7
50.	9.4
100.	8.4
150.	7.2
200.	7.4
250.	5.7
300.	3.4
350.	3.8
401.	2.8
450.	.7
501.	-.6
551.	0.0
650.	-1.6
701.	-2.1

DATE	670919
SRVY	51
TIME	1200
0.	6.4
50.	9.4
100.	8.3
150.	6.9
200.	7.3
250.	6.4
300.	4.4
350.	2.8
401.	1.5
450.	.3
500.	-1.0
550.	-1.8

DATE	671213
SRVY	52
TIME	1200
0.	8.6
50.	9.3
101.	8.1
150.	7.1
200.	7.2
250.	6.8
285.	5.6
300.	4.5
350.	2.5
401.	1.4
450.	.6
500.	0.0
550.	-2.4

DATE	680115
SRVY	53
TIME	1200
-1.	9.5
49.	9.9
99.	9.2
149.	8.2
200.	8.0
250.	8.0
350.	4.7
400.	3.3
450.	2.4
499.	.9
550.	-.8
600.	-2.0

DATE	680124
SRVY	54
TIME	1200
0.	9.6
50.	9.9
100.	9.0
150.	8.0
200.	8.2
251.	8.0
300.	5.9
351.	4.7
400.	3.4
450.	1.3
500.	-.4
524.	-1.2

DATE	680130
SRVY	55
TIME	1200
-1.	9.5
50.	9.8
100.	9.0
150.	8.2
200.	8.2
250.	7.9
300.	6.4
335.	6.2
400.	2.7
450.	1.8
500.	-.1
550.	-2.5

DATE	680208
SRVY	56
TIME	1200
0.	9.4
50.	9.8
100.	8.9
150.	7.9
200.	8.2
250.	7.9
300.	5.9
351.	3.8
400.	2.2
450.	.8
470.	0.0

DATE	680215
SRVY	57
TIME	1200
0.	9.1
50.	9.7
100.	8.8
150.	7.8
200.	8.0
251.	7.8
301.	6.2
351.	4.3
400.	2.7
451.	.6
500.	-1.1
550.	-3.3

DATE	680221
SRVY	58
TIME	1200
0.	9.1
50.	9.6
100.	8.8
149.	7.8
201.	7.9
250.	7.7
300.	6.2
350.	4.5
400.	2.1
450.	.6
499.	-.8
530.	-2.5

DATE	680226
SRVY	59
TIME	1200
-1.	9.4
50.	9.9
99.	9.0
150.	7.7
200.	7.9
250.	7.7
300.	6.0
350.	3.5
400.	1.9
450.	.3
500.	-.6
530.	-2.3

DATE	680307
SRVY	60
TIME	1200
0.	9.5
50.	9.7
100.	8.9
150.	7.8
200.	7.9
250.	7.7
300.	6.0
350.	4.5
400.	1.9
450.	0.0
500.	0.0

DATE	680313
SRVY	61
TIME	1200
200.	7.9
250.	7.7
300.	4.9
351.	2.7
401.	.7
450.	0.0
500.	-.4
525.	-2.9

DATE	680322
SRVY	62
TIME	1200
0.	10.0
50.	10.3
102.	8.6
150.	7.8
200.	7.9
250.	7.8
260.	7.8
300.	3.9
350.	2.0
400.	1.7
450.	.9
525.	-1.1

DATE	681007
SRVY	63
TIME	1200
0.	5.7
50.	9.0
100.	8.6
150.	7.7
200.	7.4
250.	7.1
300.	5.4
350.	6.6
375.	3.8
400.	2.4
450.	.8
500.	-1.7
600.	-3.9

DATE	681025
SRVY	64
TIME	1200
0.	5.8
25.	8.1
50.	9.0
100.	8.6
150.	7.6
200.	7.4
250.	7.0
300.	6.2
320.	6.3
350.	4.1
375.	2.8
400.	1.9
425.	1.2
475.	.1
525.	-1.0

DATE	681115
SRVY	65
TIME	1200
0.	6.5
50.	8.3
100.	8.4
150.	7.7
200.	7.6
250.	5.9
300.	4.3
350.	2.8
400.	2.0
430.	2.4
450.	1.0
500.	-1.1
550.	-3.1

DATE 681220 BRVY 66 TIME 1200	DATE 690113 BRVY 67 TIME 1200	DATE 690122 BRVY 68 TIME 1200	DATE 690129 BRVY 69 TIME 1200	DATE 690205 BRVY 70 TIME 1200	DATE 690212 BRVY 71 TIME 1200	DATE 690219 BRVY 72 TIME 1200	DATE 690226 BRVY 73 TIME 1200
0. 7.1 50. 6.1 100. 6.3 150. 7.8 200. 7.7 250. 6.0 300. 4.4 350. 3.4 400. 2.5 450. .8 500. *2.5 550. *2.5 600. *2.2 650. *3.0 675. *3.7	0. 7.0 50. 6.2 100. 6.2 150. 7.5 200. 7.4 250. 6.6 300. 5.2 350. 4.0 400. 3.4 450. 1.2 500. *2.6 550. *2.6 600. *2.7 625. *3.1	0. 7.0 50. 8.2 100. 8.2 150. 7.6 200. 7.6 250. 6.0 300. 3.7 350. 2.0 400. .8 450. -.1 500. *2.8	0. 7.1 50. 6.2 100. 6.3 150. 7.7 200. 7.6 250. 6.1 300. 5.3 350. 2.6 400. 1.5 450. .3 500. -.3 550. -1.7 600. -3.0	0. 7.0 50. 7.8 100. 8.0 150. 7.7 200. 7.8 250. 6.1 300. 3.8 350. 2.5 400. 1.1 450. .2 500. -.3 550. -.6 600. *2.0 650. *3.3 690. *4.7	0. 6.9 50. 7.8 100. 8.0 150. 7.5 200. 7.7 250. 6.5 300. 4.3 325. 3.1 350. 1.5 400. -.6 450. -.4 500. -1.5 550. -1.9 575. *2.4	0. 6.9 50. 8.0 100. 8.1 150. 7.5 200. 7.6 250. 6.0 300. 3.2 350. 1.0 400. -.2 450. -.5 500. *2.8 550. *2.8	0. 6.3 50. 7.8 100. 8.1 150. 7.5 200. 7.6 250. 6.4 300. 3.4 350. 2.0 400. .8 450. -.8 500. -1.7 525. *2.7

DATE 690305 BRVY 74 TIME 1200	DATE 690312 BRVY 75 TIME 1200	DATE 690319 BRVY 76 TIME 1200	DATE 690327 BRVY 77 TIME 1200	DATE 690403 BRVY 78 TIME 1200	DATE 691083 BRVY 79 TIME 1200	DATE 691120 BRVY 80 TIME 1200	DATE 691216 BRVY 81 TIME 1200
0. 6.8 50. 7.8 100. 8.1 150. 7.7 200. 6.9 250. 6.2 300. 3.5 350. 1.8 400. .1 450. -.7 500. *2.4	0. 6.8 50. 7.9 100. 8.1 150. 7.8 200. 6.6 250. 5.0 300. 3.8 350. 2.2 400. .7 450. -1.4 500. *3.2	0. 6.8 50. 7.8 100. 8.0 150. 7.5 200. 6.3 250. 4.8 300. 3.7 350. 2.7 400. 1.7 450. .7 500. -1.6 550. *2.7	50. 7.7 100. 8.3 150. 7.9 200. 7.5 250. 6.4 300. 5.4 350. 4.5 400. 2.3 450. .8 500. -1.6 600. *2.6	50. 9.0 100. 8.6 150. 7.3 200. 6.9 250. 5.6 300. 4.7 350. 1.3 400. -.5 450. *2.1 500.	50. 9.0 100. 8.1 150. 7.3 200. 6.8 250. 6.0 280. 6.0 300. 6.0 350. 1.4 400. -.9 450. -.7 500. -1.2 550. *2.8 600.	50. 9.0 100. 8.1 150. 7.4 200. 7.0 250. 7.0 280. 5.2 300. 4.7 350. 3.2 400. 1.7 450. -.4 500. -1.7 550. *4.3	50. 9.1 100. 8.3 150. 7.5 200. 7.6 250. 7.6 300. 5.2 350. 4.0 400. 2.5 450. .5 500. -1.8 550. *4.3

DATE	700114
SRVY	A2
TIME	1200
----	------
0.	8.4
23.	7.3
50.	6.8
100.	6.4
110.	6.0
118.	6.4
150.	6.7
200.	7.1
250.	7.4
300.	6.4
350.	3.9
376.	3.3
388.	4.0
400.	3.4
450.	1.5
500.	0.0
550.	.0
600.	-.4
650.	-2.2

DATE	700121
SRVY	A3
TIME	1200
----	------
0.	8.5
9.	7.9
50.	6.8
100.	6.3
119.	6.0
120.	6.2
150.	6.7
200.	7.1
250.	7.5
300.	6.2
350.	4.0
365.	3.9
387.	4.1
400.	3.2
450.	1.0
500.	.8
550.	.4
600.	-.8
650.	-2.4

DATE	700128
SRVY	A4
TIME	1200
----	------
0.	8.4
12.	7.8
50.	6.8
100.	6.3
117.	6.0
150.	6.6
200.	7.1
243.	7.8
250.	7.4
300.	6.2
350.	4.1
388.	4.1
400.	3.5
450.	1.8
500.	.6
550.	-.6
600.	-1.5
614.	-1.7
627.	-.8
650.	-1.5
700.	-2.2

DATE	700204
SRVY	A5
TIME	1200
----	------
0.	8.4
10.	7.8
50.	6.9
100.	6.4
119.	6.1
150.	6.7
200.	7.1
250.	7.8
288.	6.6
300.	5.8
350.	3.9
400.	2.7
450.	1.4
500.	.2
533.	-.2
550.	-.3
600.	-1.1
650.	-2.1
700.	-2.8

DATE	700211
SRVY	A6
TIME	1200
----	------
0.	8.4
25.	7.3
50.	6.8
100.	6.3
116.	6.0
150.	6.6
200.	7.0
250.	7.6
300.	6.3
350.	4.1
400.	2.7
450.	1.1
490.	-.2
500.	-.4
525.	-.9
550.	.1
600.	.2
650.	-.7
695.	-2.1

DATE	700218
SRVY	A7
TIME	1200
----	------
0.	8.4
50.	6.8
100.	6.3
150.	6.6
200.	7.1
250.	7.6
300.	6.3
350.	4.4
375.	4.1
400.	2.8
450.	1.2
500.	-.1
550.	-.3
600.	-1.8

DATE	700225
SRVY	A8
TIME	1200
----	------
0.	8.4
50.	6.8
100.	6.2
150.	6.4
200.	7.0
250.	6.2
300.	6.8
350.	5.0
400.	2.5
450.	1.9

DATE	700304
SRVY	A9
TIME	1200
----	------
0.	8.4
50.	6.8
100.	6.2
150.	6.5
200.	7.0
250.	7.6
300.	6.4
350.	6.5
400.	3.1
450.	1.1
500.	.9

DATE 700311 BRVY 90 TIME 1800	DATE 700318 BRVY 91 TIME 1800	DATE 700518 BRVY 92 TIME 1800	DATE 700526 BRVY 93 TIME 1800	DATE 701019 BRVY 94 TIME 1800	DATE 701106 BRVY 95 TIME 1800	DATE 701209 BRVY 96 TIME 1800	DATE 701210 BRVY 97 TIME 1800
0. 0.3	0. 0.4	0. 0.1	0. 0.5	0. 0.7	0. 0.7	0. 0.2	0. 0.4
22. 0.0	15. 0.2	15. 0.7	5. 7.5	50. 6.2	15. 0.7	90. 0.2	20. 0.4
50. 0.0	50. 0.8	50. 0.8	25. 6.5	100. 6.0	50. 0.3	150. 0.8	50. 0.2
100. 0.3	100. 0.3	100. 0.8	50. 6.3	150. 6.0	100. 0.2	200. 0.8	100. 0.0
120. 0.1	150. 0.6	150. 0.5	100. 6.0	200. 6.9	114. 5.8	250. 7.4	150. 0.2
150. 0.5	200. 7.1	200. 7.0	150. 6.5	250. 7.1	131. 0.7	300. 6.2	200. 7.1
200. 7.1	250. 7.6	250. 7.7	200. 4.8	300. 6.3	150. 6.7	350. 6.5	250. 7.4
250. 7.0	300. 6.5	300. 6.0	250. 7.5	350. 5.8	200. 7.0	400. 7.0	300. 7.4
300. 6.4	350. 6.5	350. 5.1	300. 6.3	400. 6.1	250. 7.4	450. 0.0	350. 7.0
350. 5.4	400. 5.4	400. 4.5	350. 6.4	425. 4.7	300. 6.7	500. 0.8	400. 7.0
400. 3.3	450. 1.8	450. 1.1	370. 5.4	450. 3.7	350. 5.9	550. 0.8	410. 2.4
450. 1.7	500. 0.6	500. 0.3	400. 0.2	500. 0.8	400. 5.3		450. 1.2
500. 0.8	550. 0.2	550. 0.9	450. 2.3	520. 0.8	450. 2.5		480. 0.6
535. 0.2	600. 0.9	600. 0.0	500. 0.1	550. 0.2	500. 0.7		500. 0.6
550. 0.2	650. 0.9	645. 0.2	550. 0.1	600. 0.1	550. 0.8		550. 0.6
600. 0.2		655. 0.4	574. 0.7	650. 0.2	600. 0.4		
617. 0.4		665. 0.0	585. 0.2	700. 0.3			
650. 0.8			594. 0.8				
700. 0.0			600. 0.7				
750. 0.1			650. 0.8				
			700. 0.5				

DATE 710413 BRVY 98 TIME 1800	DATE 710208 BRVY 98 TIME 1800	DATE 710311 BRVY 100 TIME 1800	DATE 710412 BRVY 101 TIME 1800	DATE 710607 BRVY 102 TIME 1800	DATE 710816 BRVY 103 TIME 1800	DATE 711004 BRVY 104 TIME 1800	DATE 711213 BRVY 105 TIME 1800
0. 0.3	0. 0.3	0. 0.3	0. 0.1	0. 0.7	0. 7.0	0. 7.0	0. 0.0
50. 0.2	13. 0.7	6. 0.6	10. 0.6	50. 5.5	13. 0.2	50. 6.1	50. 0.1
100. 0.0	50. 0.0	50. 5.8	50. 6.0	100. 5.3	50. 5.9	100. 5.8	100. 0.0
150. 0.4	100. 5.4	100. 5.5	100. 5.9	150. 6.0	100. 5.7	150. 6.2	150. 0.2
200. 0.9	150. 6.0	150. 6.2	150. 6.3	200. 6.6	150. 5.7	200. 6.9	200. 7.0
250. 7.7	200. 6.8	200. 6.7	200. 6.9	250. 7.2	200. 6.9	250. 7.8	250. 7.7
300. 7.3	250. 7.4	250. 7.7	250. 6.0	300. 6.0	250. 7.1	300. 7.8	300. 7.0
314. 7.1	300. 7.0	300. 7.4	300. 6.1	345. 6.0	300. 6.1	350. 6.2	350. 7.4
350. 5.0	317. 6.9	350. 6.5	350. 6.7	390. 5.8	350. 6.1	400. 1.1	400. 4.0
379. 5.0	350. 6.9	390. 2.7	400. 2.1	395. 4.2	380. 6.0	450. 1.7	450. 1.5
400. 1.7	400. 2.7	400. 8.0	450. .9	400. 3.0	400. 5.1	500. .7	500. 1.8
450. .1	450. 1.1	450. .1	500. .8	450. 1.5	450. 2.0	550. .7	550. .8
500. -1.1	500. .0	500. -1.9	529. 0.0	500. .2	500. .4	600. -2.0	
550. 0.0	550. -1.9	570. -2.9	550. -1.8	550. -2.4	550. .3		
600. -.2	565. -2.2	600. -1.3	600. -2.0	600. -4.0	600. -1.6		
	569. -1.4				650. -3.1		
	600. -1.6						

DATE	720110
SRVY	106
TIME	1200
----	------
0.	8.1
50.	8.1
100.	8.0
150.	8.2
200.	8.8
250.	7.5
300.	6.9
350.	7.1
400.	3.3
450.	1.6
500.	0.0
550.	-1.4

DATE	720214
SRVY	107
TIME	1200
----	------
0.	8.0
50.	8.8
100.	8.0
150.	8.2
200.	8.9
250.	7.8
300.	6.5
350.	3.3
400.	2.1
450.	.7
500.	-.6
550.	-1.2

DATE	720222
SRVY	108
TIME	1200
----	------
0.	8.0
50.	8.2
100.	8.0
150.	8.2
200.	7.1
250.	7.7
300.	4.9
350.	3.3
400.	2.1
450.	.7
500.	-1.3

DATE	720317
SRVY	109
TIME	1200
----	------
0.	7.8
50.	8.2
100.	8.0
150.	8.2
200.	7.1
250.	7.7
300.	5.2
350.	3.2
400.	1.6
450.	.5
500.	-.8

DATE	720410
SRVY	110
TIME	1200
----	------
0.	7.7
50.	8.2
100.	8.0
150.	8.1
200.	7.1
250.	7.8
300.	5.2
350.	3.3
400.	1.7
450.	.6
500.	0.0
550.	-1.4

DATE	720821
SRVY	111
TIME	1500
----	------
0.	7.8
50.	8.1
100.	8.0
150.	8.1
200.	7.1
250.	7.0
300.	5.4
350.	8.4
380.	8.9
400.	4.8
450.	1.3
500.	0.0
550.	-1.0
575.	-2.7

DATE	721020
SRVY	112
TIME	1100
----	------
0.	7.2
50.	7.3
100.	7.0
150.	6.5
200.	7.3
250.	7.6
300.	7.8
325.	8.0
350.	6.7
400.	2.0
425.	0.0
450.	-.1
500.	0.0
550.	0.0
600.	-1.9

DATE	721208
SRVY	113
TIME	1500
----	------
0.	7.2
50.	7.1
100.	7.1
150.	6.3
200.	7.2
250.	7.4
300.	7.9
350.	6.8
400.	3.2
425.	2.1
450.	1.2
500.	.5
550.	-.1

DATE	730105
SRVY	114
TIME	1100
----	------
0.	7.2
50.	6.9
100.	6.6
150.	6.2
200.	7.3
250.	7.3
300.	7.8
350.	5.5
400.	3.3
450.	1.6
475.	-.1

DATE	730216
SRVY	115
TIME	1100
----	------
0.	7.5
50.	6.9
100.	6.1
150.	6.3
200.	7.4
250.	7.4
300.	7.7
350.	4.9
400.	2.4
450.	1.3
500.	.4
550.	-1.4

DATE	730316
SRVY	116
TIME	1000
----	------
0.	7.6
50.	6.8
100.	6.3
150.	6.3
200.	7.3
250.	7.4
300.	7.6
350.	5.3
400.	3.2
450.	.9
500.	1.6
550.	.1
600.	-1.9

DATE	730325
SRVY	117
TIME	600
----	------
0.	7.1
50.	6.5
100.	6.1
150.	6.4
200.	7.4
250.	7.4
300.	7.6
350.	4.9
400.	4.5
450.	1.2

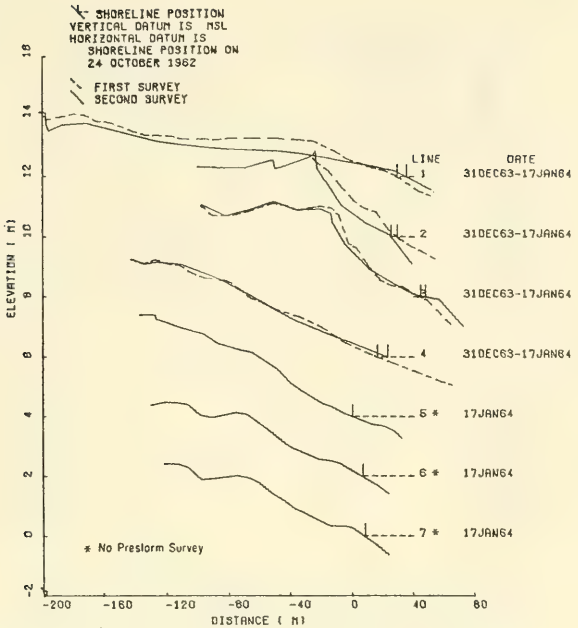
DATE	730405
SRVY	118
TIME	1400
----	------
0.	7.2
50.	6.6
100.	6.3
150.	6.4
200.	7.3
250.	7.4
300.	7.6
315.	7.8
350.	5.1
400.	2.7
450.	.7
480.	-.7
500.	-1.8

DATE	730418
SRVY	119
TIME	1300
----	------
0.	7.1
50.	6.6
100.	6.1
150.	6.3
200.	7.3
250.	7.3
300.	7.7
350.	4.6
400.	4.2
450.	1.5
500.	-1.9
550.	-2.4
554.	-2.3
562.	-.8
565.	.8
600.	.9
650.	.8
700.	0.0
750.	-1.1
775.	-1.8

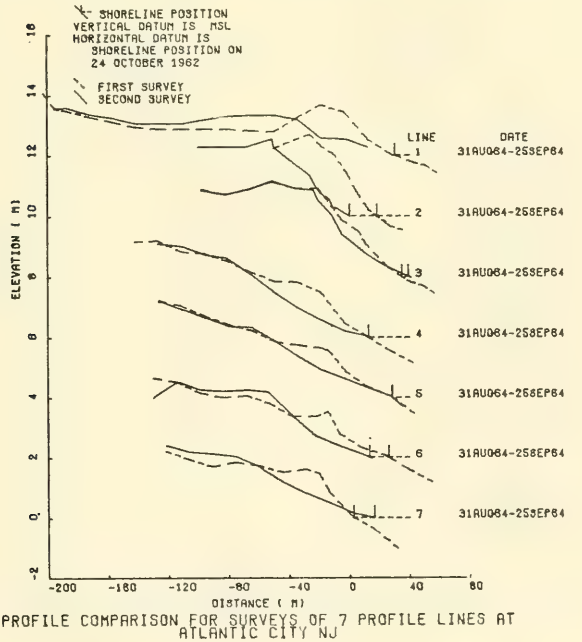
DATE	730501
SRVY	120
TIME	1100
----	------
0.	7.0
50.	6.5
100.	6.2
150.	6.3
200.	7.2
250.	7.2
300.	7.7
350.	5.2
400.	4.5
450.	1.1

APPENDIX C

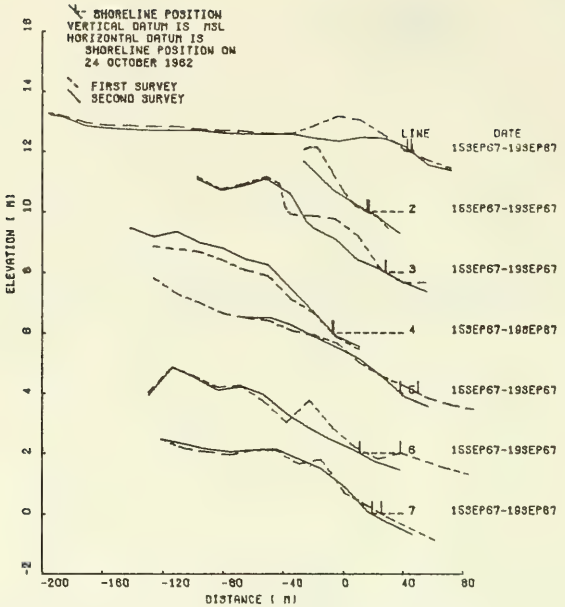
STORM CHANGE PLOTS - PROFILE COMPARISON FOR SURVEY OF SEVEN PROFILE LINES AT ATLANTIC CITY



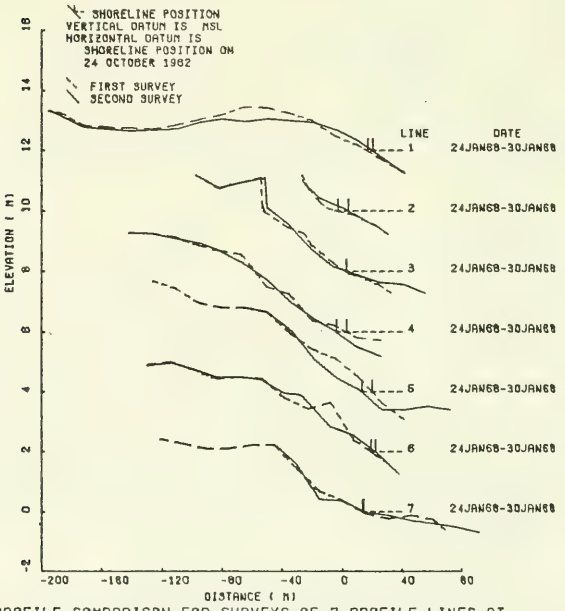
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



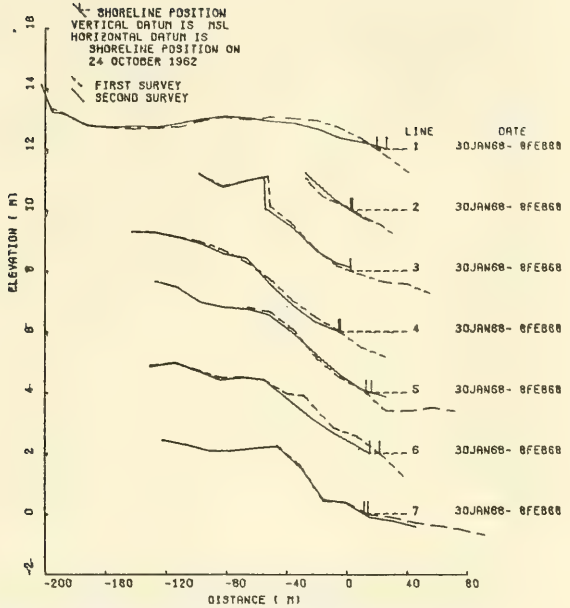
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



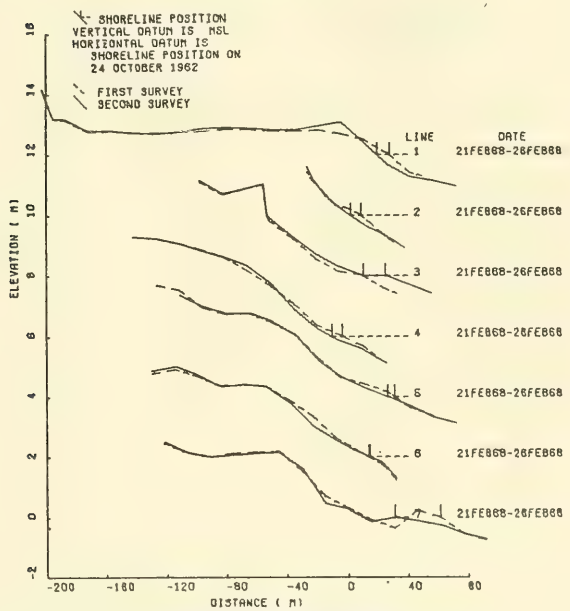
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



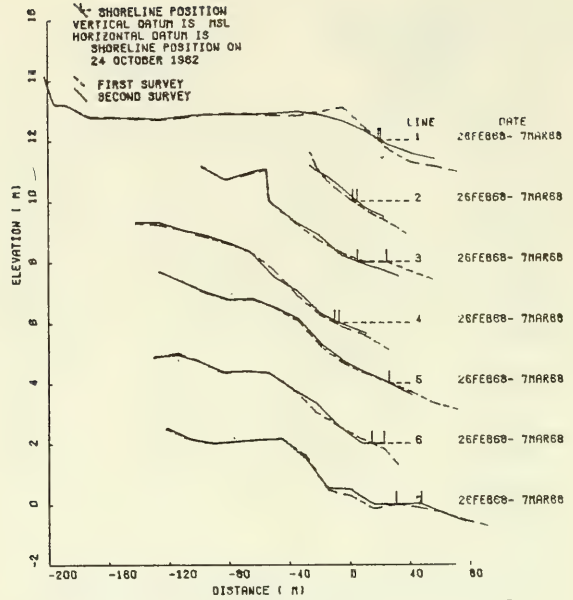
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



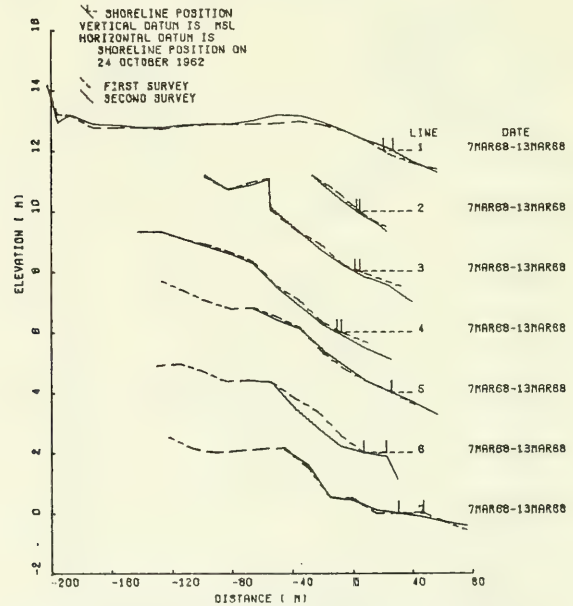
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



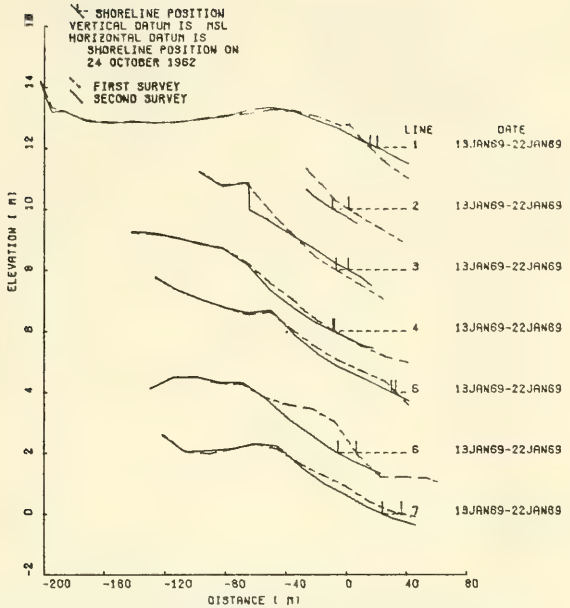
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



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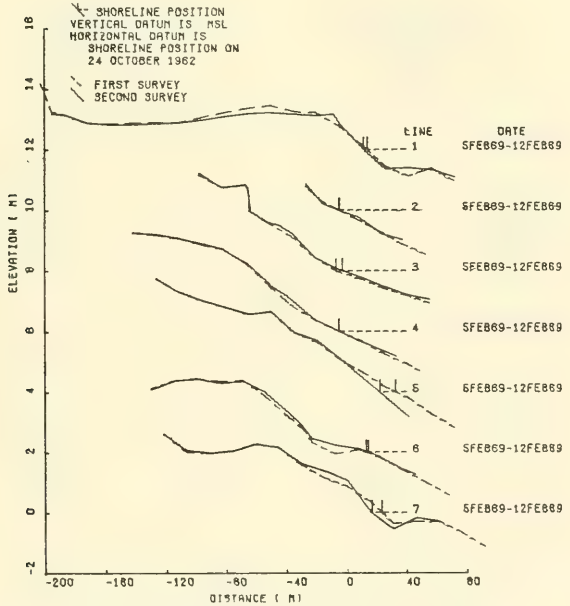

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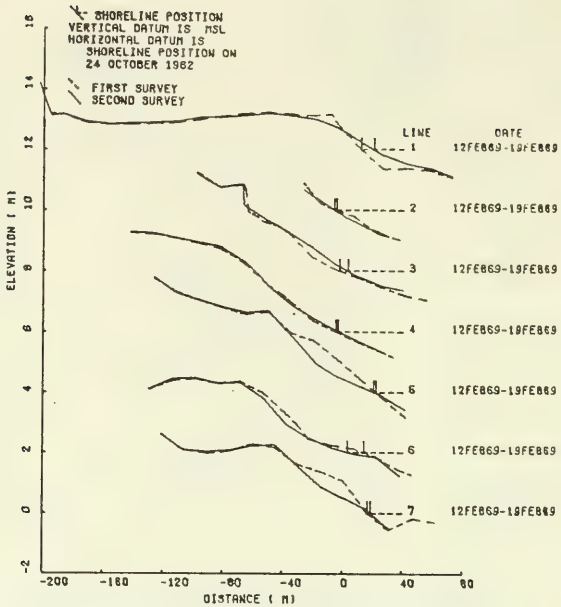
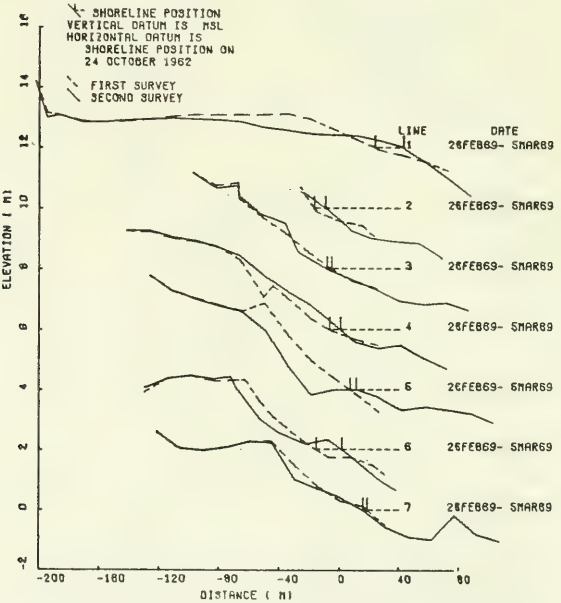
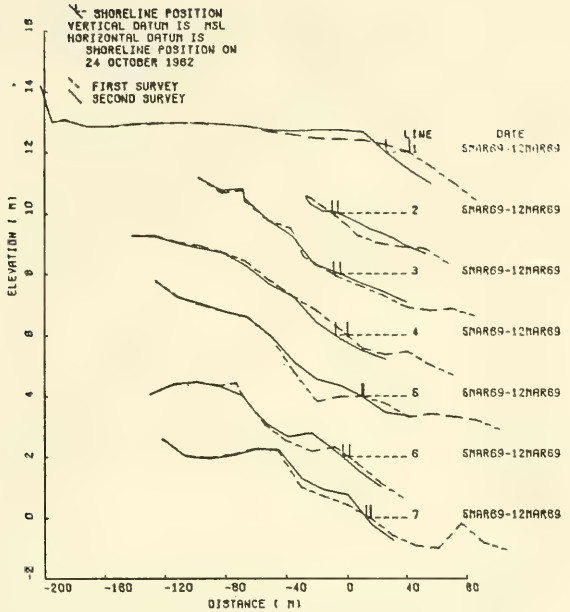


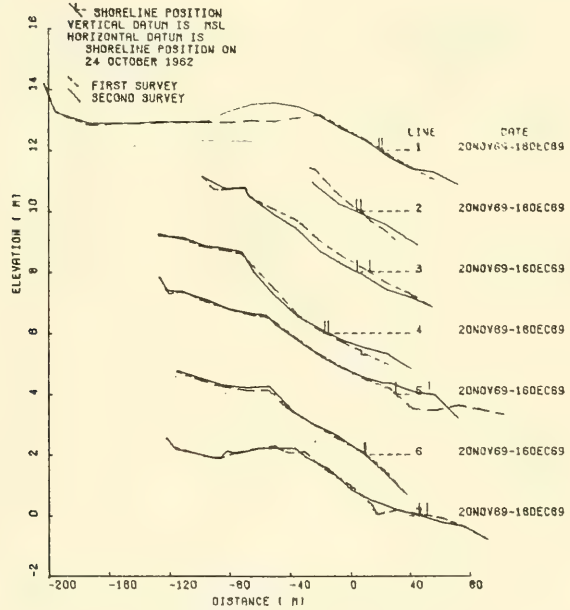
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



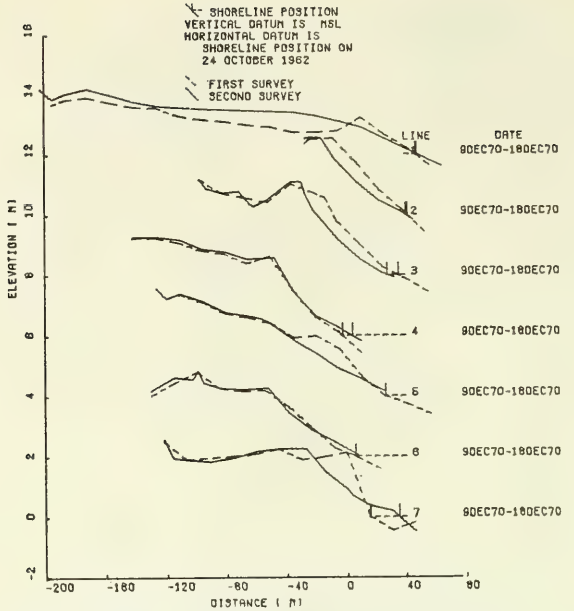
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



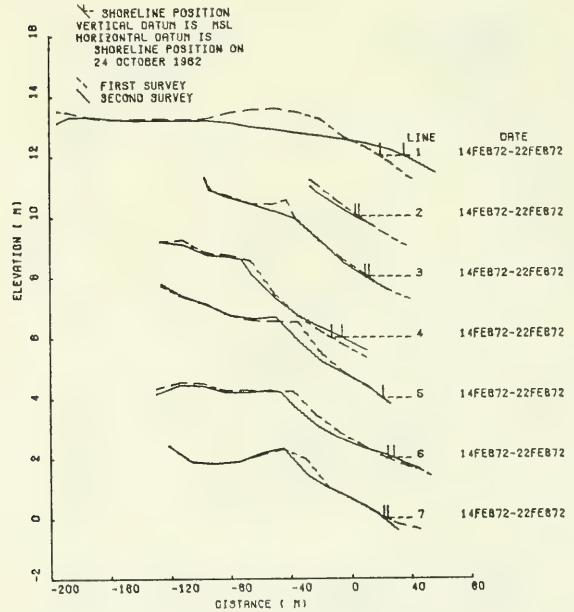
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



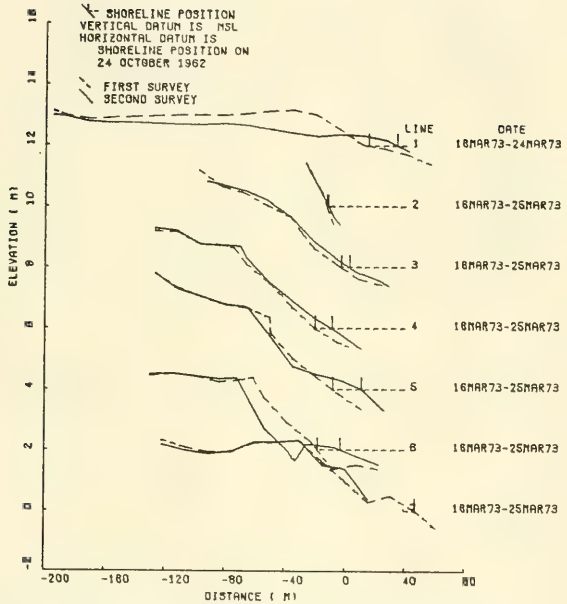
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



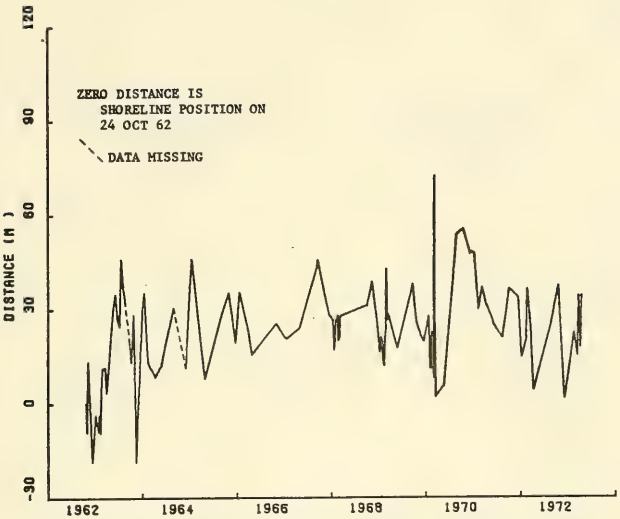
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ

APPENDIX D

MSL SHORELINE CHANGES

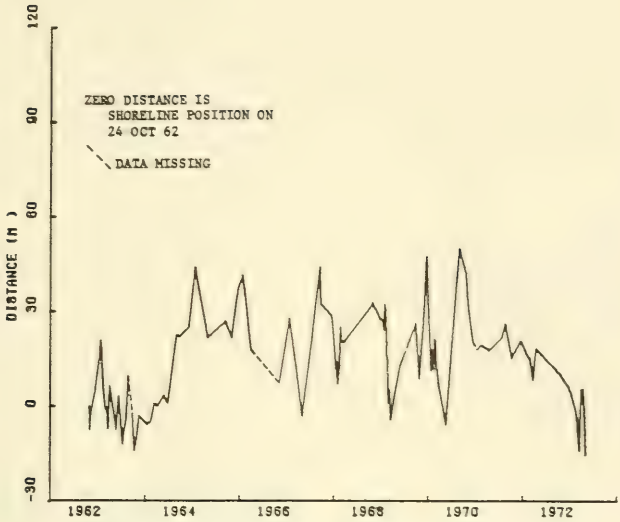


CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 1 ATLANTIC CITY, NEW JERSEY

CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 2 ATLANTIC CITY, NEW JERSEY

CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 3 ATLANTIC CITY, NEW JERSEY

CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 4 ATLANTIC CITY, NEW JERSEY



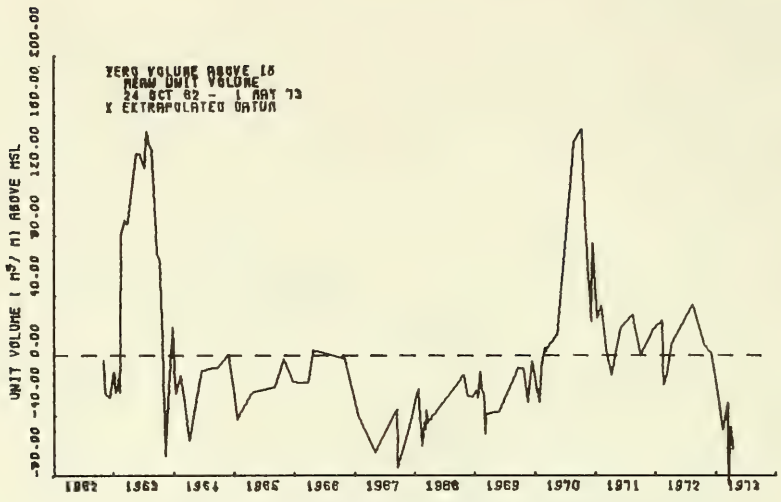
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 5 ATLANTIC CITY, NEW JERSEY

CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 6 ATLANTIC CITY, NEW JERSEY

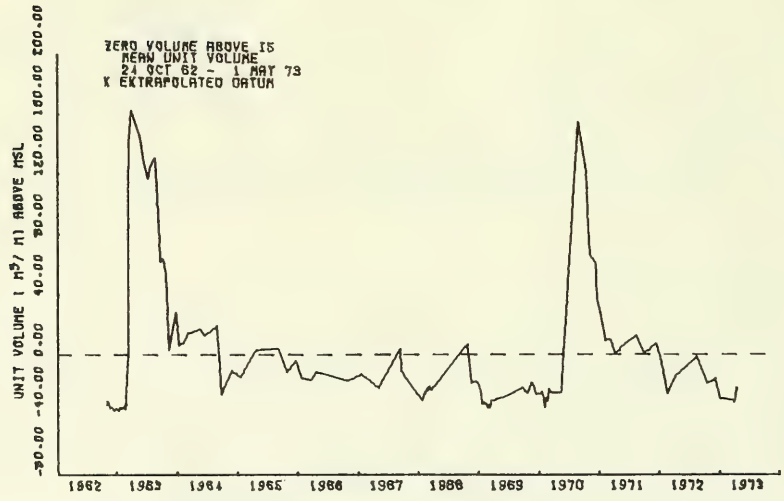
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 7 ATLANTIC CITY, NEW JERSEY

APPENDIX E

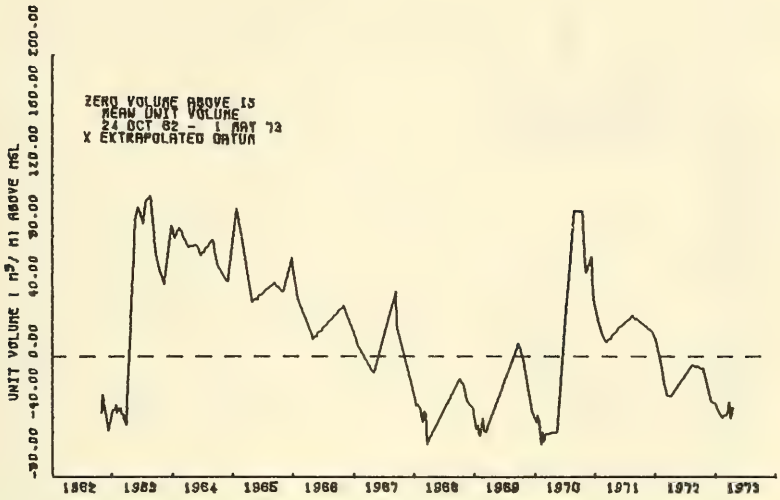
ABOVE MSL UNIT VOLUME CHANGES



UNIT VOLUME CHANGES FOR PROFILE LINE 1 AT ATLANTIC CITY NJ

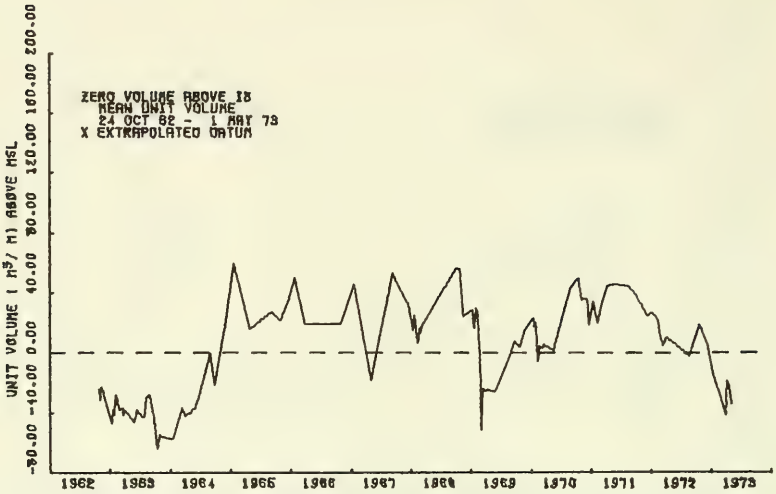


UNIT VOLUME CHANGES FOR PROFILE LINE 2 AT ATLANTIC CITY NJ

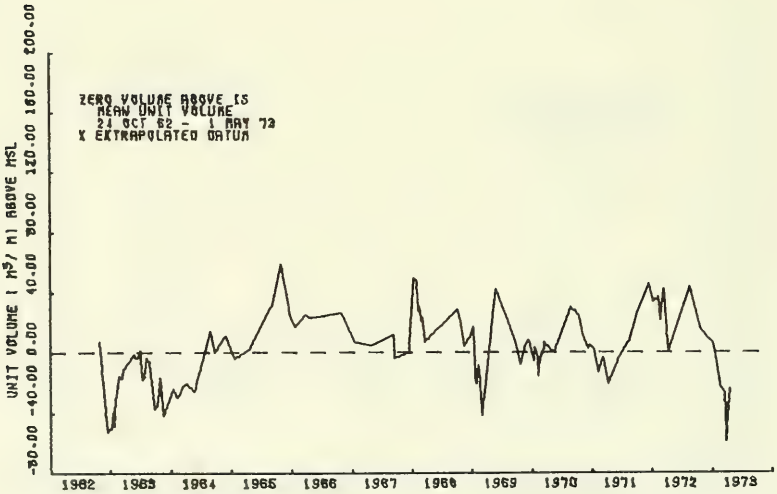


UNIT VOLUME CHANGES FOR PROFILE LINE 3 AT ATLANTIC CITY NJ

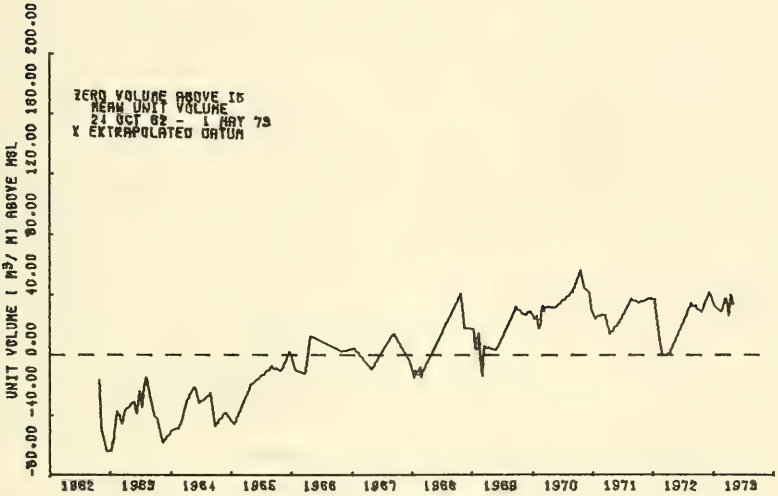
UNIT VOLUME CHANGES FOR PROFILE LINE 4 AT ATLANTIC CITY NJ



UNIT VOLUME CHANGES FOR PROFILE LINE 5 AT
ATLANTIC CITY NJ



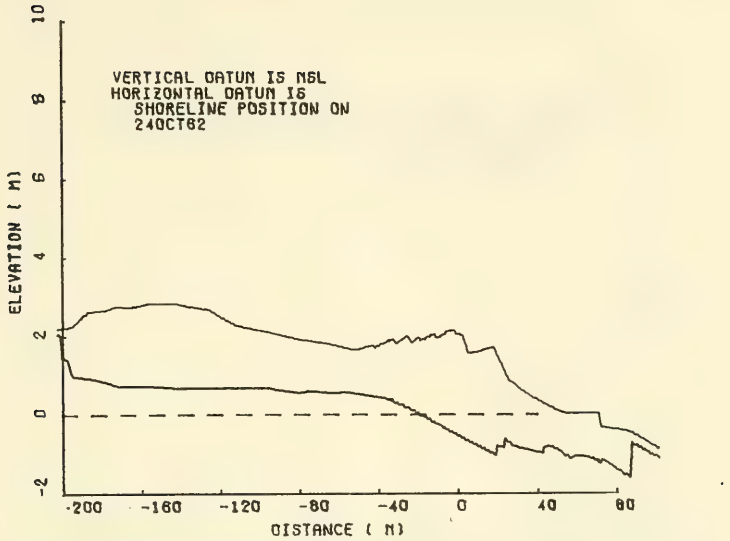
UNIT VOLUME CHANGES FOR PROFILE LINE 6 AT
ATLANTIC CITY NJ



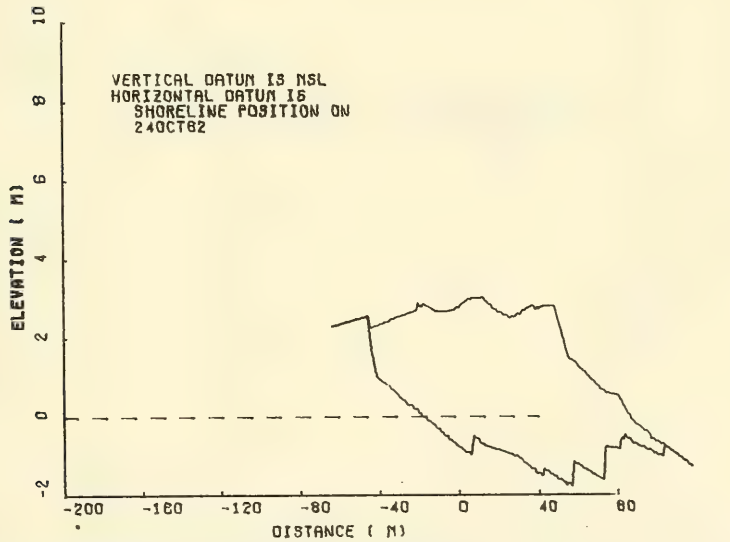
UNIT VOLUME CHANGES FOR PROFILE LINE 7 AT
ATLANTIC CITY NJ

APPENDIX F

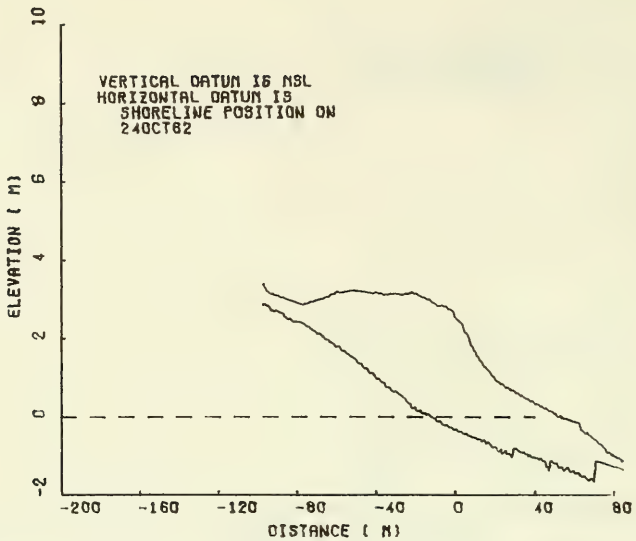
PROFILE ENVELOPES



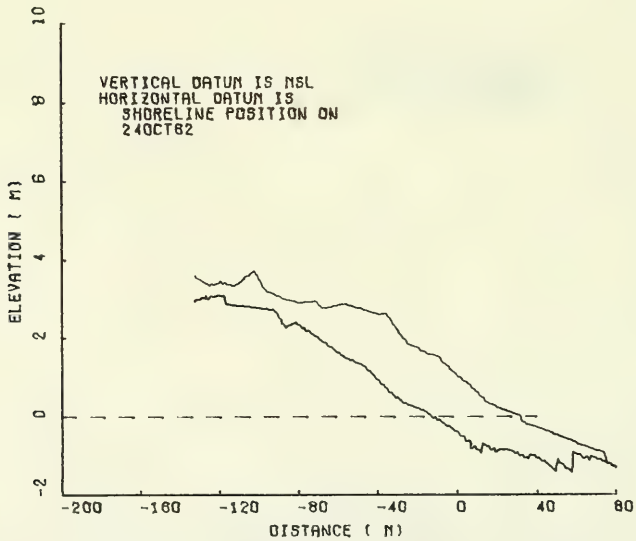
PROFILE ENVELOPE FOR PROFILE LINE 1 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



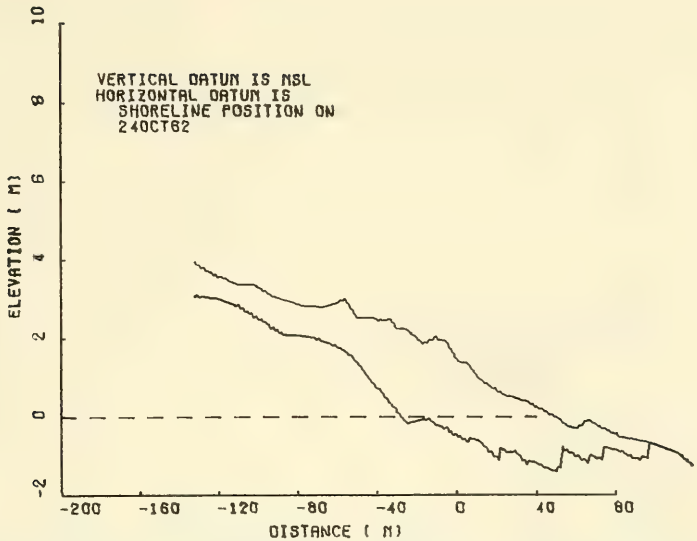
PROFILE ENVELOPE FOR PROFILE LINE 2 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



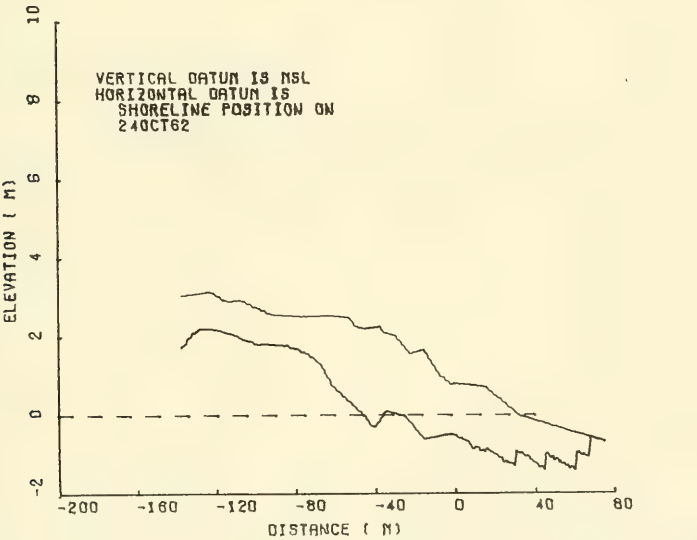
PROFILE ENVELOPE FOR PROFILE LINE 3 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



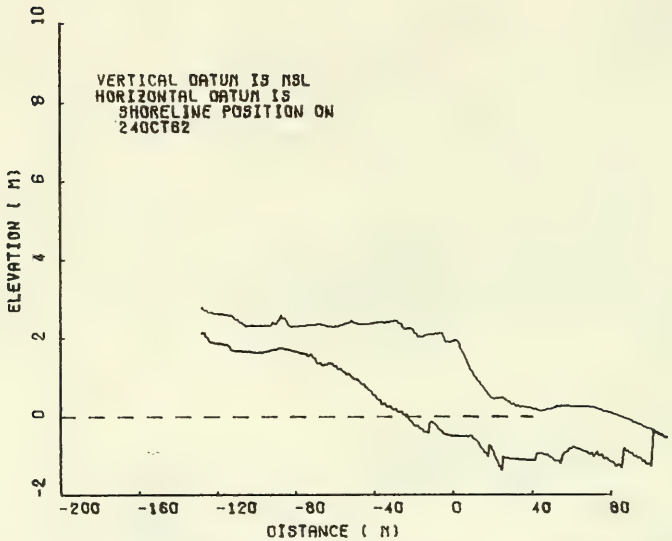
PROFILE ENVELOPE FOR PROFILE LINE 4 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



PROFILE ENVELOPE FOR PROFILE LINE 5 AT ATLANTIC CITY NJ
240CT62 - 1MAY73



PROFILE ENVELOPE FOR PROFILE LINE 6 AT ATLANTIC CITY NJ
240CT62 - 18APR73



PROFILE ENVELOPE FOR PROFILE LINE 7 AT ATLANTIC CITY NJ
240CT62 - 1MAY73

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TC203 .U581mr no. 81-3 627

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